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# Pension Reforms: Results and Challenges



INTERNATIONAL  
FEDERATION OF PENSION  
FUND ADMINISTRATORS



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Av. 11 de Septiembre 2155, Torre B, Piso 14, Providencia, Santiago.

Telephone: (56-2) 381 17 23

Fax: (56-2) 381 26 55

E-mail: [fiap@fiap.cl](mailto:fiap@fiap.cl)

[www.fiap.cl](http://www.fiap.cl)

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Alonso Ovalle 1465

Telephone: (56-2) 672 58 81

E-mail: [secretaria@ciedess.cl](mailto:secretaria@ciedess.cl)

[www.ciedess.cl](http://www.ciedess.cl)

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# PRESENTATION

It is not very long since the crisis of the pay-as-you-go social security systems in both Latin America and Central Europe gave rise to the creation of schemes based on the individual capitalization and private management of savings.

However, sufficient time has passed to enable an evaluation to be made of the first trends to be shown by these systems and to compare them with the results of the pay-as-you-go social security schemes.

That is the challenge that we gave ourselves in the Seminar “Results and Challenges of Pension Reforms”, where we analysed the results of the new system, from the point of view of both its contribution in improving pensions and the part it has played in the economic growth of the countries concerned.

In order to do this we have checked the rates of return on the investments of social security resources and compared them with the growth in workers’ earnings, which is the basis used for calculating pensions under the pay-as-you-go systems; we have measured the impact of this reform on saving, investment and the depth of capital markets, in an attempt to measure its contribution to the economic development of the countries.

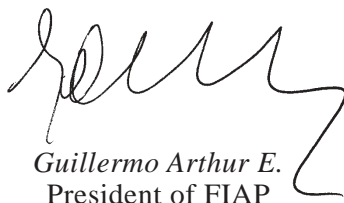
We have also analysed the influence that a system based on private ownership of savings may have on public policies, and its ability to resist pressures that might undermine the integrity and final purpose of these assets.

For this task we have had the invaluable support of outstanding specialists in various subjects, and I take this opportunity to thank

them for the significant contribution that they have made to the future development of these systems.

The social security reform has been a radical change. Capitalization replaces pay-as-you-go; private management replaces that of the state; flexibility replaces inflexibility.

For this reason we must make the effort to show both those who carried out the reform and those who are watching the experience with interest, that the decision was a right one. The social security reform, based on individual capitalization and private fund-management, has brought our workers and our countries significant benefits and will continue to do so in the future.



Guillermo Arthur E.  
President of FIAP

# PENSION REFORM IN LATIN AMERICA: DESIGN AND EXPERIENCES

ROBERT PALACIOS<sup>1, 2</sup>

## 1. INTRODUCTION

Some areas of public policy require very long-term horizons. Global warming and pension policies are two good examples. In these areas, decisions today produce consequences many decades into the future yet there is inevitably a high degree of uncertainty as to the outcome. For this reason, the original course plotted must be continuously corrected in light of new evidence. No pension system that exists today is likely to remain exactly the same by the time young affiliates retire in forty years.

With this in mind, this paper incorporates new observations from countries that have recently engaged in systemic pension reform in

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<sup>1</sup> Senior Pension Economist of the Social Protection Department of the World Bank. Master's in Economic Sciences from the University of Delaware and Licentiate in International Relations from the same university.

Mr Palacios directs and contributes to the "Pension Reform Primer", a series of publications which collects applied research material in a constant process for the benefit of professionals of the World Bank and those responsible for adoption of policies.

He is a consultant on pension reform throughout the world and it has fallen to him to advise in various countries, such as: Albania, Bhutan, Bosnia, China, Dominican Republic, Eritrea, Hungary, India, Korea, Senegal, Slovenia and Sri Lanka.

He has held other important positions in the World Bank, especially concerned with pensions.

He is the author of a wide-ranging collection of publications on pensions. Among others, he is co-author of "Ageing without Crisis: Policies for Protecting the Elderly and Promoting Growth", the most important paper on pension systems in the world, from the World Bank.

<sup>2</sup> This study was prepared with the assistance of the International Federation of Pension Fund Administrators (FIAP) as part of the "Pension Reform Primer" series.

I would like to thank Augusto Iglesias and Edward Whitehouse for their valuable comments and Alex Iuculano for research assistance. I am also grateful to the members of FIAP for their valuable contribution of information and comments.



Latin America. It is not the first survey of reforms in the region and it will certainly not be the last<sup>3</sup>. It is written however, at a moment that many consider a crossroads for this new model of pension provision.

The paper is structured as follows: The next section reflects on the factors that allowed systemic pension reform to unfold in Latin America at the end of the 20<sup>th</sup> century. Section 3 compares the design of the new systems in twelve countries with an emphasis on important differences regarding implicit objectives, rules and regulations and institutional configurations. Section 4 reviews the experience in a subset of the countries where implementation has occurred and highlights key areas where further improvements should be considered. The fifth section offers preliminary conclusions as to the early experience, recommendations for improvements in design and criteria with which to measure the long-term success of the new systems.

## **2. THE FACTORS LEADING TO SYSTEMIC PENSION REFORM**

During the last century, pension schemes mandated and run by the government spread to every corner of the world. Their defined benefit promises and the liabilities implied increased much faster than any reserves that were accumulated to back them. Recently however, the pendulum has begun to swing in the opposite direction. Liabilities are being reduced, funding ratios increased and the private sector is playing a larger role in managing the system<sup>4</sup>. Arguably, the most important manifestation of this broader shift has involved a specific kind of reform that incorporates a fully funded and privately managed element. We refer to these here as ‘systemic reforms’. Starting with Chile, this type of reform has been adopted by twelve Latin American countries or about half of the systems worldwide that fall into this category. The last decade was the first in a century that saw the number of systemic reforms adopted outnumber the countries introducing the old model.

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<sup>3</sup> See for example, Chapters 1, 4 and 5 of Feldstein (1998), Valdes-Prieto (1998) and Schmidt-Hebbel (1999) Devesa-Carpio and Vidal Melia (2002) and Jimenez and Cuadros (2003) among others.

<sup>4</sup> Parametric reforms that reduce promised pensions, development of voluntary private pension schemes and recent attempts to build reserves using private asset managers and commercial criteria for partially funded public schemes are additional examples. See Palacios (1999).

The obvious questions are why did these reforms first take root in Latin America and what explains the surge in systemic reforms during the last decade. The answer to this question is the subject of research for those who study political economy of reform and policy transfer. While a growing body of literature is focused on the pension reform phenomenon in Latin America and elsewhere<sup>5</sup>, this issue lies beyond the scope of this paper. Here, the objective is only to provide a backdrop for the main part of the study—where reform design and experience are reviewed.

## 2.1. Ideas, people, examples and the reform context

Historic shifts in policy tend to depend on the convergence of several factors. In 1997, Anne Krueger described the radical shift that had taken place in the debate over international trade policy and economic development where there an intellectual consensus in favor of import-substitution policies had held sway for several decades<sup>6</sup>. In analyzing how thinking had evolved, Krueger cited theoretical and applied research that questioned the strategy and analyzed why the model appeared to have failed in so many cases. In parallel, there was also an important demonstration effect in the form of stellar growth of export-led economies like Korea, Taiwan and Singapore.

Similarly, in the pension debate, researchers began to seriously question the economic impact of the unfunded public pension model in the 1970s<sup>7</sup>. They began to document problems of long run sustainability and transfers between and within generations. By the early 1990s, a significant body of literature critical of the model existed. Importantly, by that time Chile had provided the first real world evidence of an alternative. The early success of the Chilean pension reform had an impact on the pension debate similar to that of East Asia's 'tigers' on the debate about trade.

While Krueger cited the importance of challenges to conventional wisdom through research and successful examples of alternatives, Harberger (1993) emphasized the role of technocrats. Their role is likely to be even more critical when there is little or no experience with a new policy. This was the case in Chile when the pension reform was conceived.

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<sup>5</sup> See Muller (2002), for example.

<sup>6</sup> Krueger (1997).

<sup>7</sup> For example, Feldstein (1974).

Context also matters. Individuals attempting to introduce systemic pension reforms challenge vested interests and the reforms always involve winners and losers. Success is more likely when there is a general challenge to established policies, especially in the context of (more or less) democratic environments as was the case in all reforming countries except Chile<sup>8</sup>. This was the exactly the environment that characterized Latin America going into the 1990s<sup>9</sup>. The so-called “Washington Consensus” came to represent this coalescence of views on the need for a certain menu of reforms. One concrete manifestation was the wave of privatizations in the region during this decade<sup>10</sup>.

By the 1990s, policymakers in favor of scaling back the role of the state could be found in many Latin American countries and some were familiar with emerging critiques of the existing model of pension provision<sup>11</sup>. Moreover, the Chilean reform was increasingly judged to have been successful. Chilean consultants provided advice and many countries sent study tours to Santiago. But the fact that the ideas, people, examples and reform context were all aligned favorably for systemic pension reform would probably not have been sufficient to overcome the inertia of public pension policy and resistance from certain interest groups. Reforms did proceed however, due in large part to the failings of the existing systems.

## **2.2. The state of pension systems prior to systemic reform**

Various authors have described the situation leading up to the passage of legislation for systemic pension reform<sup>12</sup>. The main factors cited include:

1. Increasing pressure on the central budget to cover deficits
2. Inequities within and across schemes

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<sup>8</sup> For a discussion of social policy under military rule in Chile, see Castiglioni (1993).

<sup>9</sup> See Williamson (2003).

<sup>10</sup> Latin America generated more privatization revenues every year between 1990 and 1999 except 1995 than other regions. Countries that implemented systemic reforms were among the most active privatizers. Average annual privatization revenues during the 1990s as a share of GDP were 2% for Argentina, 1.5% for Bolivia, 0.7% for Colombia, 0.9% for Mexico and 1.6% for Peru. See World Bank (2001).

<sup>11</sup> Muller (2002) refers to “an ‘epistemic community’, a network of professionals in a particular domain and with a common enterprise, sharing faith in a set of normative and causal beliefs” and cites specific examples of individuals involved with reforms in Argentina, Bolivia, Peru and Uruguay.

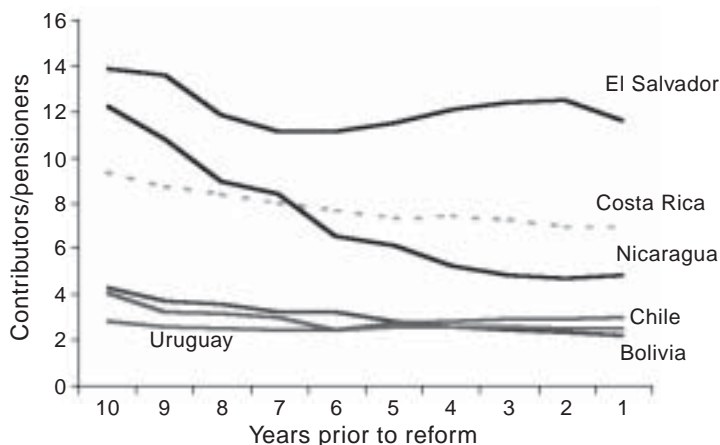
<sup>12</sup> See for example, Cifuentes and Larrain (1998), Edwards (1998), Cattoni and Demarco (1998), Sales and Solis (1998), Mesa-Lago (2000), Ayala (2000) and World Bank (2000).

3. Lack of long term sustainability due to internal demographics
4. Failure to provide promised benefits
5. Poor management of reserves, past or present
6. Distortion of labor market and incentives to evade

The relative importance of these factors varied greatly across countries as evidenced by the heterogeneity of initial conditions in the twelve countries that chose systemic reform. The ratio of contributors to pensioners for example, was much lower in some countries and fell more sharply in some than others in the years leading up to the reform as shown for selected countries in Figure 1.

By the time of the reform, Argentina, Chile and Uruguay had expensive, mature systems and massive unfunded pension liabilities. There were fewer than three, and in some cases two, contributors for every pensioner; and the demographic transition was well under way. In contrast, young countries like the Dominican Republic, El Salvador and Mexico spent a relatively modest amount on pensions. A few of the younger countries still held reserves and at least four contributors for every pensioner. Contribution rates, the extent of fragmentation and the degree of intragenerational inequity also varied significantly. In short, conditions just before the reforms were very different, as shown in Table 1.

**Figure N° 1**  
**EVOLUTION OF SUPPORT RATIO IN**  
**THE YEARS LEADING UP TO REFORM**



Source: BPS (2000); Cifuentes and Larrain (1998); SAFP (2002).



**Table N° 1**  
**CONDITIONS PRIOR TO REFORMS**

	Pension spending % GDP	Level of reserves	System support ratio main pension scheme	Implicit pension debt as % of GDP in 1990	Degree of fragmentation <sup>1</sup>
Argentina	6.2	None	6.0	305	Moderate
Bolivia	2.5	Some	3.0	31	High
Colombia	1.1	Some	12.1	35	High
Costa Rica	1.6	Significant	6.6	94	Moderate
Chile	5.7	None	2.5	131	High
Dominican Republic	0.8	None	17.0	22	Low
Ecuador	2.0	Some	5.6	19	Low
El Salvador	0.4	Some	11.6	9	Low
Mexico	1.0	None	8.0	37	Low
Nicaragua	2.5	Some	4.8	14	Low
Peru	1.2	None	4.3	45	Moderate
Uruguay	15.0	None	1.4	290	Low

Sources: Bravo and Uthoff (1998) for implicit pension debt figures. Cottani and Demarco (1998); Edwards (1998); Palacios (2003); Cifuentes and Larrain (1998); Rofman (2003); Kleinjans (2003); Palacios and Pallares-Miralles (2000).

<sup>1</sup> Refers to the extent to which multiple programs were paying different benefits to different groups of workers. Although all countries except Uruguay had separate schemes for civil servants, others such as Bolivia and Colombia were characterized by a large number of separate 'cajas'.

What they did share in common was the erosion of credibility of the old pay-as-you-go systems and the institutions that administered them. An important reason for this disillusionment was the decline and/or volatility of replacement rates that could be observed even in systems with favorable internal demographics. This was often due to a lack of indexation of the earnings base or the pension itself. Frustration also grew after decades of experience with the inefficient bureaucracies that kept the records and paid benefits. As Valdes-Prieto (1998) observed, 'existing state-managed pension systems failed to meet the expectations that justified them in the first place, of providing significant security to their members. This frustration pervades Latin America...'

While reformers cite fiscal pressure, the desire to increase long term savings and stimulate capital market development,

inequitable redistribution within and across generations, labor market distortions and concern for the long term sustainability of the system, the failure of the public schemes to deliver was critical. The acceptance of systemic reforms by voters in 11 democracies was largely a reflection of this frustration with the old model.

Further evidence of worker dissatisfaction can be found in the switching pattern - i.e., the proportion of workers that decided to choose a funded, private scheme over the alternative public, defined benefit option. As described in Palacios and Whitehouse (1998), younger workers generally opted to switch into the new system when given a choice. In Argentina, and Chile, more than 80 percent of those able to choose below age 40 switched to the funded scheme. More than half of the younger workers switched in Colombia and Peru. In Uruguay, the number joining the funded scheme exceeded expectations by 500 percent. In El Salvador, where the public institutions were largely discredited, eighty percent of those eligible to switch did so<sup>13</sup>.

Today, when pay-as-you-go schemes are offered to new workers as an alternative in Argentina and Peru, only a small proportion chooses them<sup>14</sup>. In Chile, support for the system is widespread after 20 years of experience. Since the return of democracy over a decade ago, no political party has advocated a return to the old model.

Nevertheless, the loss of confidence with the existing system was greater in some countries than others. Vested interests, including the public pension fund bureaucrats themselves, carried more political clout in some countries than in others. Finally, the extent to which the role of the state was being challenged and the priorities of reformers were by no means uniform. An analysis of these factors is not the purpose of this study, but they probably explains much of the variation in system design that is the subject of the next section.

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<sup>13</sup> Acuña (2003) describes the high switching rates and cites long delays of two or three years in the payment of benefits after retirement as one of the causes of dissatisfaction with the pre-reform institutions. He also points out the strong influence of the sales force and notes that roughly 2.5 percent of those that switched would later return to the old scheme after realizing the low value of their recognition bonds.

<sup>14</sup> Since the default option is the funded scheme, this could also be interpreted as evidence of indifference on the part of workers. A strikingly high percentage of new entrants to the labor market do not choose an AFJP in Argentina according to official statistics.

### 3. COMPARING THE DESIGN OF THE NEW PENSION SYSTEMS

The twelve countries covered in this paper all have in common the introduction of a fully funded, privately-managed component based on defined contributions to their pension systems<sup>15</sup>. This is a fundamental departure from the model that became prevalent during the 20<sup>th</sup> century that relied on public management and unfunded, defined benefit promises. Within this new paradigm however, the actual design and implicit objectives of the new schemes vary significantly.

It should be noted that this section ignores the residual pay-as-you-go schemes that survive for a finite period during the transition and affect mostly older workers. It also ignores the parallel pay-as-you-go schemes that continue to be an option to workers in Argentina, Colombia and Peru. The implications of maintaining a competing parallel model will be discussed further in the next section. This would be a significant omission if a large proportion of workers continued to participate in the public schemes. However, it appears that only in the case of Colombia is it likely that the parallel pay-as-you-go scheme will play a significant role in the long run.

With this caveat in mind, this section reviews three aspects of the design relevant for the systemic reform. These are: (i) implicit benefit schedules, (ii) rules and regulations and (iii) institutional arrangements.

The *implicit benefit schedule* refers to outcomes –measured primarily by replacement rates– which are implied by the parameters of the defined benefit and defined contribution elements of the system in steady state. Analyzing these outcomes using simulations facilitates cross-country comparisons of overall system size, the proportion of the system that relies on private versus public schemes and the degree to which the new systems rely on pay-as-you-go versus funding.

Included in rules and regulations are *investment, charges and other aspects of the accumulation period as well as the conditions*

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<sup>15</sup> Although Ecuador is included in this review, it appears that challenges in the Supreme Court and a lack of support from the current government may result in a situation similar to what took place in Venezuela after a law introducing a funded system was passed in 1998 but never implemented.

*and modalities for the withdrawal or payout phase.* The minimum pension guarantees found in many of the systems are also considered here as part of the payout phase design. Finally, system design includes *institutional arrangements*, including the scope of the mandate, conditions for market entry including participation of state-owned firms, collection of contributions and supervision. We begin with the benefit schedule implied by the legislated parameters of the new multipillar systems.

### 3.1. Implicit benefit schedules of the new pension systems

The first objective and the heart of any pension system design is the replacement rate that can be expected upon retirement. This ratio will normally vary according to income, number of contributions and even by gender. The replacement rate measure is relevant because it provides an indication of how consumption is being smoothed over the life cycle, a key objective of the pension system. The second objective of most pension systems is to redistribute towards those workers that would fall into poverty despite having saved regularly, namely the lifetime poor. The replacement rate for low-income workers provides an indication of how the pension system addresses this objective.

One way to compare the target replacement rate across countries is to impose a standardized set of assumptions and simulate the outcome for the same individual. These ‘synthetic replacement rates’ remove some of the noise due to particular labor market circumstances in different countries and time periods. They have been calculated for OECD countries in previous studies, and more recently for a sample of East European countries<sup>16</sup>. Those studies revealed large differences due to the parameters of the defined benefit formula, taxation and in cases where relevant, to the size of the individual account contribution. These differences in turn, help to contrast the underlying policy objectives and show just how much they can vary across countries.

However, cross-country comparisons abstract from important factors that affect the actual replacement rate outcomes. For example, differences in inflation rates combined with benefit formulas that do not adjust pre-retirement earnings will miss or

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<sup>16</sup> See for example, OECD (1989), Whiteford (1995) and Whitehouse (2001) and (2003).



understate a potentially important design difference. Standardizing assumptions such as contribution density is also unrealistic if the objective is to predict replacement rates in different countries. This is especially true if it is known that formal labor force participation rates vary significantly. Finally, the synthetic replacement rate calculations do not take into account differences in the key relationship in funded schemes - the rate of return relative to the growth of covered wages. Nevertheless, by standardizing assumptions and focusing on new entrants, it is possible to isolate differences stemming purely from the design of the system as opposed to external factors.

Table 2 shows the synthetic replacement rates for eight of the twelve countries and is taken from a forthcoming study by Whitehouse (2003) to whom we refer the reader for further information on assumptions and methodology. Before looking at the results, it is useful to highlight four important points about the simulations: First, the results refer to a worker contributing during his entire working life. This means that replacement rates will be higher than what is actually observed for most workers and will abstract from redistribution from long to short tenure workers. Second, the simulation is for a male worker. The replacement rate from the funded component would be lower for a woman where sex-specific mortality rates are used for the calculation of benefits. Third, the concept used as the denominator for the replacement rate is lifetime revalued average wage. This is consistent with an analysis of life cycle consumption smoothing, but replacement rates may appear high relative to figures often presented based on final wages. Finally, the figures are net replacement rates - that is the take-home pension after taxes is compared to the take-home wage after taxes. Again, this is consistent with an analysis of the life-cycle consumption smoothing objectives of a pension scheme<sup>17</sup>.

The table shows the replacement rates expressed as a share of lifetime earnings for workers with half the average wage through two and one half times the average wage for eight countries based on current parameters and standardized assumptions. It reveals a wide range of implicit benefit schedules across countries. Replacement rates for lower income workers are highest in

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<sup>17</sup> Further research has been commissioned focusing on partial contribution history and gender dimensions but do not appear to affect the main results of the comparisons discussed here.

Uruguay and Argentina and are twice the rates in El Salvador and Chile. Costa Rica and Uruguay stand out due to the high replacement rates for workers across the entire income range shown here. In the case of Uruguay, this result is even more pronounced if the fact that it is the only country with automatic wage indexation of benefits.

The differences between countries arise for several reasons. The most important are (a) the contribution rate to the individual account (b) the defined benefit formula where one applies (c) and the level of the minimum pension guarantee. Another factor is the use of country-specific mortality rates. It could be argued that this introduces an idiosyncratic element that confuses system design with conditions specific to the country. Taking life expectancy differences into account seems justified given that it will determine the annuity that can be obtained for a given set of assumptions for the funded scheme including the contribution rate.

Table 2 does not include replacement rates for the small group of higher income workers with lifetime average wages greater than 2.5 times the average wage. This ignores the impact of an important design difference affecting overall system size, namely the placement of ceilings. The ratio of ceilings to average covered wages across

**Table Nº 2**  
**SYNTHETIC, FULL CAREER, NET REPLACEMENT**  
**RATES BY LIFETIME WAGE<sup>1</sup>**  
**(AS A PERCENTAGE)**

	0.5	0.75	1	1.5	2	2.5
Argentina <sup>2</sup>	134	103	87	70	63	58
Chile	59	60	61	62	64	67
Colombia	109	73	58	58	58	58
Costa Rica	111	111	111	112	112	112
Dominican Republic	112	75	56	37	32	33
El Salvador	66	44	39	41	42	41
Peru	72	73	74	75	77	80
Uruguay	129	129	129	114	93	74

Source: Whitehouse (2003). See paper for assumptions and methodology.

<sup>1</sup> Assumes male worker entering labor market in 2003 with full contribution density.

<sup>2</sup> Assumes seven percent contribution to individual account is maintained.

countries is shown in Table 3. Although ceilings usually affect a relatively small share of affiliates, these high-income individuals command a disproportionate share of the wage bill. Table 3 shows that ceilings are set at very different levels across countries.

### 3.1.1. Size of the system compared

The ceiling in Chile is about three times average wage while the ratio in five of the countries is three times as high and two countries have no ceiling at all. The differences are even greater than suggested by the figure due to indexation rules; in Chile for example, where the ceiling is effectively price indexed, the covered wage bill as a share of total wages is gradually shrinking over time<sup>18</sup>.

While the implied replacement schedule and the ceilings provide an indication of the scope of the pension systems, it is necessary to

**Table N° 3**  
**COMPARISON OF CONTRIBUTION CEILINGS IN 11 COUNTRIES**

Country	Multiple of average wage
Chile	3.1
Uruguay	5.7
Argentina	5.8
Mexico	6.4
Colombia	10.0
Dominican Republic	10.3
Mexico	11.0
Bolivia	12.5
El Salvador	14.4
Costa Rica <sup>1</sup>	None
Peru	None

Source: Whitehouse (2003).

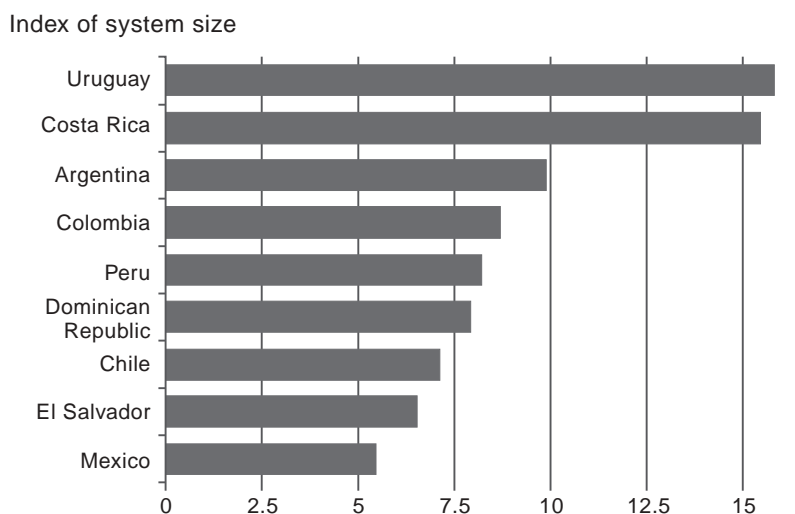
<sup>1</sup> Costa Rica has a ceiling on benefits.

<sup>18</sup> For the purposes of the simulations, the ratio of the ceiling to the average wage was assumed to remain constant.

take income distribution into account in order to get a more accurate sense of the relative size of systems. This is possible by applying a standardized distribution of wages to the figures shown in Table 2. Whitehouse (2003) does this by assuming a lognormal distribution of wages that approximates observed patterns and takes into account the greater importance of the lower part of the wage distribution. The final step in the calculation is to calculate the present value of the pension stream by applying country-specific mortality tables. The result is an index of ‘pension wealth’ expressed as a multiple of the average wage in each country. The index can be interpreted as the average pension wealth for full-career, male workers in each country.

The results in Figure 2 are driven by several factors. For example, higher levels of pension wealth are being generated in countries like Costa Rica and Uruguay partly because of their higher life expectancies at retirement. Lower ceilings, in contrast, will reduce the pension wealth indicator since the wages of higher income individuals will not be replaced in the form of pension benefits.

**Figure N° 2**  
**COMPARISON OF PENSION WEALTH SIMULATION RESULTS**



Pension wealth as a multiple of average earnings, average value weighted over different earnings levels.

Source: Whitehouse (2003).



Figure 2 suggests that Costa Rica and Uruguay are by far the most ambitious schemes in terms of generating pension wealth (note that Argentina would rise to 11.9 if the original contribution rate for individual accounts was applied). The rest of the sample lies along a fairly wide spectrum around an average of close to 10 times the average covered wage<sup>19</sup>.

The difference between the steady state implied by the design of the scheme and the current situation becomes apparent. For example, compared to Uruguay, Costa Rica currently spends less than one fifth as much on pensions relative to GDP and much less than Chile. This illustrates the point that comparing system design based on current indicators is misleading because each is at a different stage of maturation and at a different point in the demographic transition. Comparing current indicators is especially deceptive given that the new schemes have only recently been introduced so that the current benefit and eligibility conditions will be very different after the reforms are fully implemented.

The conclusion from the replacement rate and pension wealth simulations of Whitehouse is that there is significant heterogeneity among the reform countries with regard to their implicit objectives for consumption smoothing and redistribution. Some countries have much more ambitious targets than others. The next important aspect of design is the composition of this pension wealth.

### *3.1.2. Relative size of public versus private pension elements*

A second key aspect of pension system design is the mix between public, unfunded and privately-managed, funded elements. One way of measuring this is by looking at the proportion of the overall replacement rate generated by unfunded defined benefit promise as opposed to the fully funded element. This is superior to comparing the proportion of the contribution going to each type of scheme for several reasons. First, none of the residual DB schemes are in actuarial balance and therefore, the proportion of contribution going to finance them tends to understate their importance in terms of the ultimate benefit. Second, earmarked non-payroll tax revenues are already used to finance several systems as in the case of some countries such as Argentina and

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<sup>19</sup> Note that the figures are sensitive to the assumed net return-wage growth differential.

Uruguay so the true proportion of financing destined for each part of the system should incorporate these sources. Third, the actual reliance on public DB versus private DC depends heavily on the scope of the minimum pension guarantee.

Figures 3a-h show that, in addition to the variation in terms of overall benefit levels described above, the proportion of these replacement rates generated by public DB (including minimum pension guarantees) and private DC vary widely across countries.

So, for example, Figure 4a shows that for the high income Argentine male worker with a complete contribution history, about half of the net replacement rate comes from the annuity purchased from the individual account and only one fourth comes from the unfunded, public component. For a low-wage worker, in contrast, two thirds or more of the replacement rate comes from the unfunded, DB element. The residual area at the top of the figure, arises because of difference in tax rates during work as compared to during retirement<sup>20</sup>.

At one end of the spectrum lie Chile and Peru (where the simulations assume that the current minimum pension for older cohorts and contributors to the public, DB scheme is eventually extended to new entrants) with the smallest unfunded elements. In contrast, Costa Rica and Uruguay, continue to rely predominantly on the annuities generated by their public DB schemes<sup>21</sup>. In the Dominican Republic, despite the fact that there is no contribution to a public DB scheme, the defined benefit element is very large due to a high minimum pension guarantee combined with a relatively low contribution rate.

It should be noted that the importance of the minimum pension guarantee as shown in these figures (left-hand corner triangles) is a kind of lower bound estimate. Although higher rates of return would reduce the size of these triangles, the combination of lower contribution densities and application of sex-specific mortality tables in the case of women would increase the size of all of the triangles<sup>22</sup>. The main point however, is that there is a huge

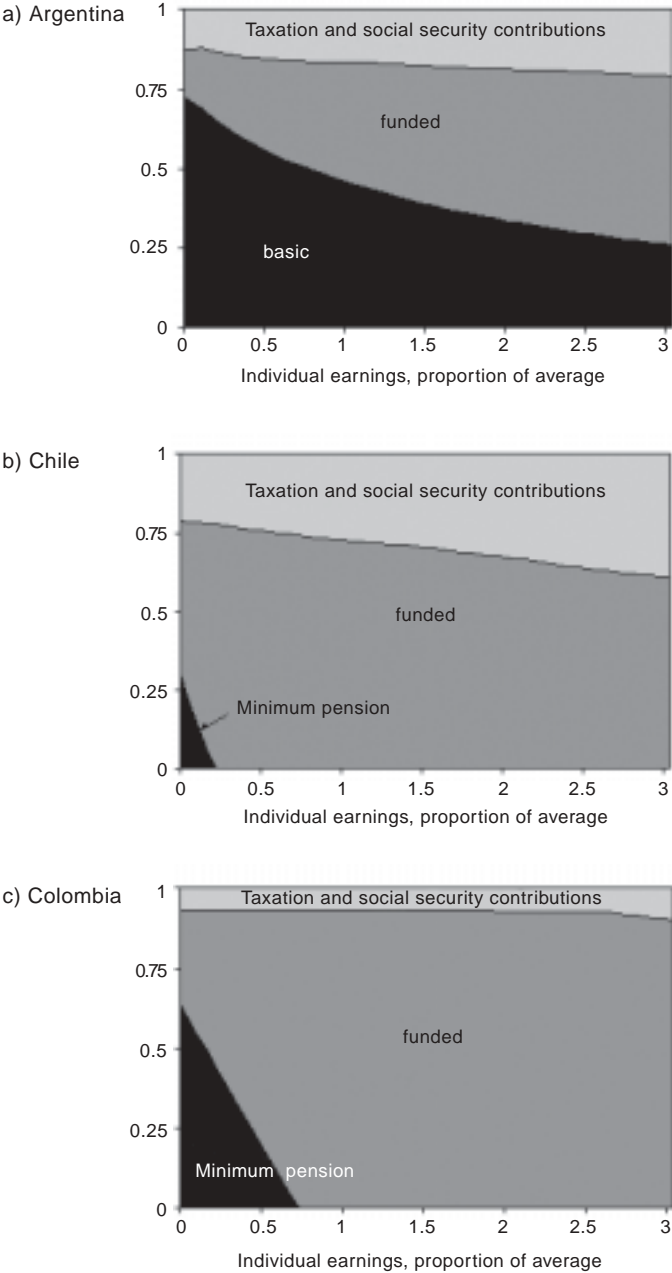
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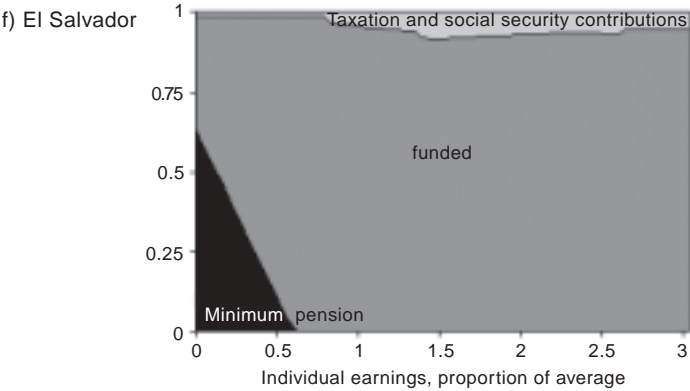
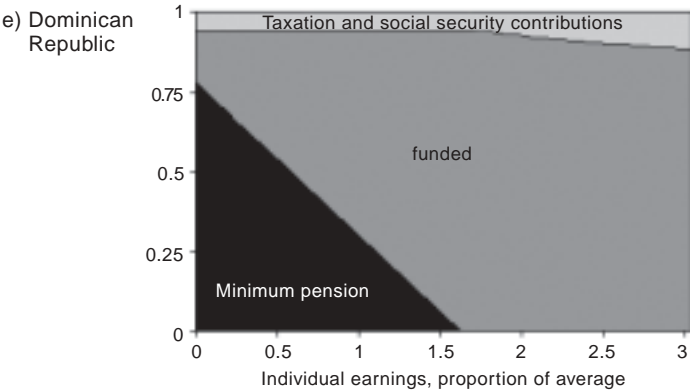
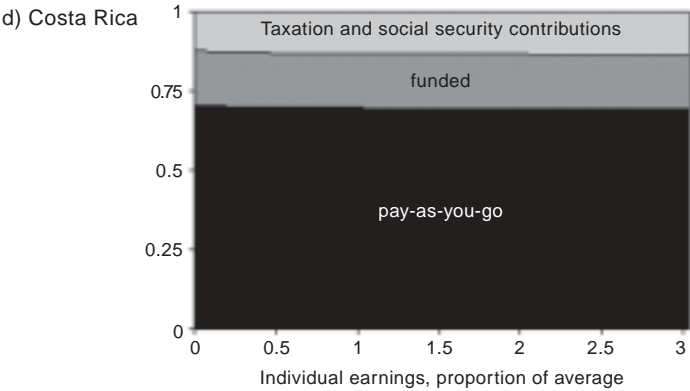
<sup>20</sup> Other sources of income in retirement are not taken into account but would generally affect only individuals with significant voluntary retirement savings.

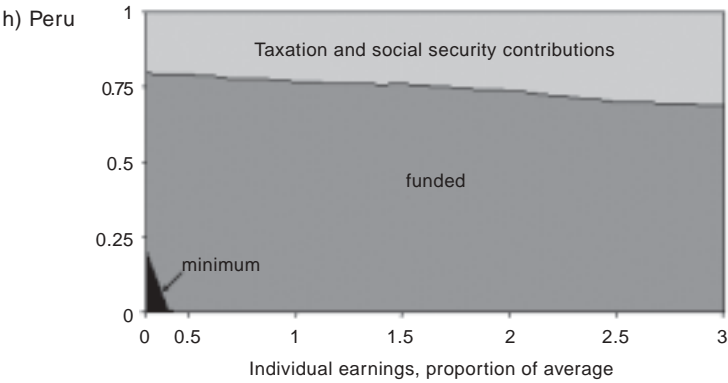
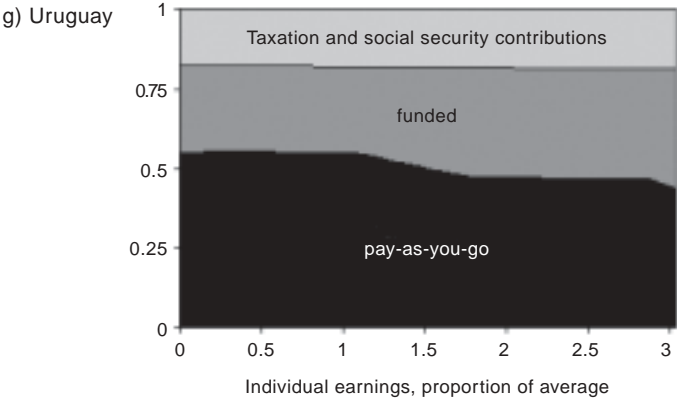
<sup>21</sup> Post-retirement indexation provisions have not been taken into account and would affect the comparison for Uruguay relative to the rest of the countries. Its current policy of wage indexation only increase the relative size of the public DB annuity.

<sup>22</sup> Implications of different minimum pension guarantee approaches is discussed later in the paper.

**Figure N° 3a - N° 3h**  
**SOURCES OF NET REPLACEMENT RATES IN EIGHT COUNTRIES**







Source: Whitehouse (2003).

variation not only in the size of the schemes, but in the relative importance of the role of privately-managed individual accounts in achieving these pension targets. Characterizations of these systems that ignore these differences by applying a simplistic taxonomy are highly misleading.

### *3.1.3. Funding ratio*

A third key objective implicit in the design of the system is the proportion of liabilities for which assets are to be set aside or the funding ratio<sup>23</sup>. One way to think of the target funding ratio in the system is that in steady state, it is directly related to the proportion of the total replacement rate provided by the funded component. It might appear at first glance that the implied funding ratio should be highest in the countries in which the entire contribution goes to the individual account. As noted already however, the existence of minimum pension guarantees (MPG) means that a liability exists in these countries and will depend on how the MPG is designed. A further complication is that MPGs are at least partially funded in two countries, Colombia and Dominican Republic<sup>24</sup>.

The funding ratio is also increased by public pension reserves in the public DB program. While there are some reserves in Colombia, the only country where these can be considered significant is Costa Rica. In 2002, the reserves of the Caja Costarricense de Seguridad Social were roughly 14 percent of GDP and were still growing. Nevertheless, with estimated liabilities many times this amount, the funding ratio for the public DB scheme is relatively low.

Abstracting from the funds accumulated in the defined benefit elements of the system –i.e., solidarity funds and reserves in the residual defined benefit scheme– the relative amount of funding across the countries is a function of the overall replacement rate and the proportion that is covered by the funded component of the system. It is clear that the funding ratios are reduced (a) the larger

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<sup>23</sup> It is important to highlight that the counterproposal to systemic reforms is typically a combination of parametric reforms and build up of reserves in a partially-funded, defined benefit scheme not, as is often portrayed, a pure, pay-as-you-go scheme.

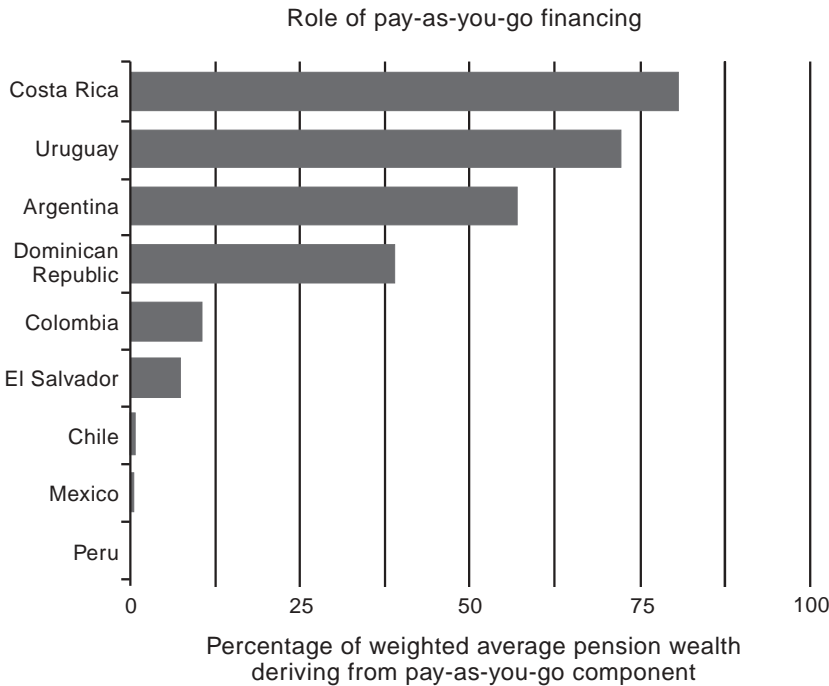
<sup>24</sup> In Mexico, flat matching contributions also reduce the liability arising from the MPG, but this is already taken into account in the simulations by adjusting the contribution rate by income level.

the public, defined benefit scheme and (b) the larger the minimum pension guarantee in the funded system.

In Figure 3 above, a total pension wealth indicator was estimated for each country. Figure 4 shows the proportion of that wealth generated by the unfunded, defined benefit component of the system. Not surprisingly, Costa Rica and Uruguay rely most on pay-as-you-go financing. In systems dominated by the funded component, the Dominican Republic stands out as having a defined benefit element that is large due to the combination of a low contribution to the individual account and a high minimum pension guarantee.

These results provide some support for the contention that higher initial implicit pension obligations lead to a lower proportion of

**Figure N° 4**  
**PROPORTION OF SYSTEM FINANCED ON A PAY-AS-YOU-GO BASIS**



Source: Whitehouse (2003)



the system being privatized<sup>25</sup>. However, while the estimates in Figure 4 are a superior proxy for the extent of privatization than say, the proportion of the contribution going to the funded scheme, it ignores the proportion of contributors covered in the first years and the speed of the transition. Even ignoring this, it is also clear that much of the variation cannot be explained solely by the size of the pre-reform liability. Chile and the Dominican Republic stand out at both ends of the spectrum, suggesting that there are other reasons driving policy choices.

### *3.1.4. Redistribution*

The replacement rates presented in Table 2 above are indicative of the consumption smoothing outcomes for individual workers with certain wage histories that contributed regularly. The second objective of pension policy is to redistribute to those individuals who, despite having saved within the system, are not able to generate a level of consumption acceptable to the society.

The fact that replacement rates are higher for the lower income workers in most of the countries in Table 2 is evidence of the intention to redistribute<sup>26</sup>. The dark triangles for countries with minimum pension guarantees in the bottom left hand corner of Figures 3a-3h provide one measure of the extent and variation of the distributional component of the system. As mentioned however, this representation is a lower bound but shows that the proportion of the contribution that goes to the funded scheme is a poor indicator of the amount of redistribution in the system.

In principle, a system based on privately-managed, defined contributions can generate the same or greater amount of redistribution toward the lifetime poor as the traditional system that it replaces. The amount of redistribution depends largely on the level and eligibility conditions for the minimum pension in both types of system. In the Mexican case, it also depends on the matching government contribution to individual accounts - a kind of prepayment of the minimum pension. There are however, at least three areas where differences can be identified.

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<sup>25</sup> See for example, Brooks and James (2000).

<sup>26</sup> Note that the figures implicitly ignore flat charges that would reduce replacement rates for lower relative to higher income workers. This would not change the picture significantly.

The first difference is that minimum pension guarantees in funded, DC schemes are not usually financed from payroll taxes while minimum pensions in defined benefit schemes are typically financed from contribution revenues. This being said, the distinction is not universal. Colombia and the Dominican Republic both attempt to finance part of the minimum pension from an earmarked payroll tax or ‘solidarity contribution’. At the same time, mature pay-as-you-go systems such as Uruguay’s are already financing expenditures including the minimum pension from revenues other than payroll taxes.

Despite these exceptions, it is clear that the new model tends to rely more on general revenues to finance redistribution to the lifetime poor<sup>27</sup>. This has the merit of reducing taxes on labor and is likely to entail a more progressive revenue source than payroll taxes. On the other hand, where coverage is low, it could be argued that relatively well-off workers from the formal sector are not the best target for scarce budget transfers intended to alleviate poverty. Another interpretation of the guarantee is as a kind of systemic guarantee akin to a guarantee on bank deposits.

While the question of the role of minimum pension guarantees relative to social assistance programs for the elderly is beyond the scope of this paper, there is clearly a stronger case for reliance on the latter when coverage is limited, as in most of the countries here<sup>28</sup>. A recent study by CEPAL illustrates the potential costs of expanding social assistance schemes to cover all elderly. Using an extreme urban poverty line and considering only those ages 65 and above, the study estimates costs of between 0.4 to as much as 2.3 percent of GDP with most countries in the range of 1 per cent of GDP. In some countries, this would represent a significant share of the budget, raising the question of opportunity cost in the face of other vulnerable groups requiring social assistance.

A second important difference between the traditional DB model and systems that rely mainly on defined contribution is the greater

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<sup>27</sup> This is recognized by critics of the systemic reforms who seem to prefer redistribution within the pension system over ‘external’ mechanisms. Mesa-Lago (2002) in a section on welfare tradeoffs of the new systems, complains that “Structural reforms, particularly of the substitutive type, are devoid of endogenous solidarity”. It is not clear however, why what he refers to as ‘exogenous solidarity’ is inferior or cannot achieve the same social objectives as endogenous solidarity.

<sup>28</sup> For a comprehensive analysis of social assistance schemes for the elderly in Latin America, see ILO (2002).

prevalence of transfers between members of the scheme for reasons unrelated to poverty. These ‘intra-generational’ transfers have been documented for many public, DB schemes in the form of higher internal rates of return for workers with certain characteristics (short careers, late entry to the labor force, married versus single etc.). Pay-as-you-go defined benefit schemes are also more likely to apply special eligibility rules and retirement rules to different categories of workers than those based on defined contribution, further increasing the disparities in outcomes. Many of these transfers between members are regressive, benefiting privileged groups and higher income workers.

In general, the minimum pension guarantees of defined contribution schemes provide a more transparent method of effecting transfers to lower income groups and reduce the prevalence of regressive transfers. A good example is the tendency to use non-linear accrual rates to redistribute in defined benefit schemes. In this common approach, workers are credited with a larger benefit per contribution at the beginning of their careers.

This allows those with partial or broken careers, disproportionately women and workers that enter and exit the informal sector frequently, to receive a higher internal rate of return on their contributions relative to workers that contribute during their entire career. This may lead to a progressive result overall, but because there is no income test, high income workers with partial contribution histories also receive a subsidy at the expense of low income workers that contribute regularly. A minimum pension guarantee on the other hand, can provide progressive transfers to those with less than complete contribution histories while taking income into account to avoid some of the leakages<sup>29</sup>.

Some critics of the reformed systems claim that the replacement rates and/or internal rates of return for women ~~is~~are reduced by the introduction of defined contributions. As already mentioned, this does not follow for those who qualify for a minimum pension since there is no intrinsic reason that eligibility conditions should be stricter or benefit levels should be any lower in one model compared

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<sup>29</sup> Leakages can still occur especially on a household basis where the spouse of a high income worker may accumulate a relatively small balance and qualify for the minimum pension guarantee unless this is subject to a household asset and income test.

with another. Moreover, in either type of system, minimum pensions are likely to accrue to women disproportionately thereby offsetting the observed wage differentials that will affect any type of earnings-related, contributory scheme.

Not surprisingly, the simulations dealing with gender impact show that the outcome depends on many factors and vary across women. Generalizations about gender effects without taking into account retirement age, contribution density and income level among other factors are misleading or simply wrong<sup>30</sup>.

It is clear however, that middle or higher income women who contribute to the system regularly no longer benefit from the implicit use of unisex mortality tables in the defined benefit scheme if sex-specific tables are allowed for the conversion of balances into annuities<sup>31</sup>. If benefits are actuarially fair however, this simply equates the present value of the benefits for men and women. As in the case of non-linear accrual rates, higher rates of return to higher income women are not usually considered desirable.

A final consideration that merits more study in the future are the rules that apply to the payout stage of the system including requirements for joint annuities as well as the mandated level of survivors benefits. Both will have an important bearing on how women fare in the reformed systems. Moreover, the ultimate impact involves complex intrahousehold allocations<sup>32</sup>.

Before concluding the discussion on redistribution, it is important to point out that a comprehensive view of the incidence of the reform itself would take into account contributions as well as benefits. Rates of return over the life cycle would have to be compared before and after the reform. This comparison is extremely complex and those who wish to compare the redistributive outcomes in the new system with those of the old system are faced with daunting methodological problems.

First, there is a long transition in most cases such that the relationship between contributions and benefits changes from both

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<sup>30</sup> See for example, Rofman and Gruschka (2003) for the results of simulations in Argentina.

<sup>31</sup> Arenas de Mesa and Gana Cornejo (2001) discuss these points and provide empirical evidence.

<sup>32</sup> Bertranou and Arenas de Mesa eds. (2003).

intra and intergenerational perspective. Second, the new system often involves changes to parameters that are not related to the paradigm shift from unfunded, defined benefit to funded, defined contribution such as changes in the retirement age. Third, the counterfactual is extremely difficult to pin down; specifically, would the unsustainable unreformed scheme have been allowed to run large deficits in order to keep benefit promises or would benefits have been eroded through underindexation or future cuts as has been common practice in the past? Finally, the assumptions regarding key relationships such as the rate of return on investments versus the growth of wages will largely determine the results of the analysis.

There are very few studies available that allow such comparisons and in most cases, the results are difficult to interpret due to the intractable problem of determining the proper counterfactual. In one of the few studies of its kind, Bucheli (1999) calculates generational accounts for male and female workers of different income levels in Uruguay<sup>33</sup>. The impact of each of the individual reform measures on these individuals is calculated and summed to provide a measure of the incidence of the reform. Among other findings, the study shows that high income men and low income women gained the most from the reforms while middle income women lost the most using the baseline assumptions. The study also found, not surprisingly, that the comparison was very sensitive to the assumed wage growth and investment return combination. In short, such comparisons are extremely difficult to make and require both a careful analysis of different kinds of workers as well as sensitivity analysis to changes in key assumptions.

### *3.1.5. Conclusions*

This review of implicit benefit schedules shows that there are clearly important differences in the overall size and sources of the replacement rates in the different reformed systems. The degree to which the systems are funded in the steady state also varies greatly. Costa Rica and Uruguay have very high replacement rate targets relative to the others and are much more dependent on a pay-as-you-go defined benefit component. Argentina and the

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<sup>33</sup> The case of Uruguay is perhaps the most robust in terms of a reasonable counterfactual given the history of automatic indexation of benefits. Even in this case however, the long term sustainability of the scheme was highly suspect so that to assume that benefits would have remained at the same levels in the future is rather heroic.

Dominican Republic rely mostly on the funded scheme for upper and middle income workers but maintain a relatively large pay-as-you-go, defined benefit element for redistribution. Chile, Mexico and Peru and to a lesser extent Colombia and El Salvador rely much more on the private, individual accounts scheme.

These findings would, for the most part, be reinforced by taking into account factors such as non-linear accrual rates, indexation methods and other details of system design. The role of minimum pension guarantees will be larger to the extent that contribution densities are lower. Finally, the Colombian system in its broader sense would show a much greater reliance on the pay-as-you-go, public, defined benefit component if the indefinite existence of the parallel scheme were to be taken into account. The implications of these design differences are addressed at the end of Section 3.

### **3.2. Funded scheme rules and regulations**

The unfunded, defined benefit part of the system is run by the government or a quasi-public institution. The funded, defined contribution scheme in contrast is generally managed by private firms that have been licensed to participate in the market and who must obey a certain set of rules. These rules affect the performance of the system by restricting investment options, charges and payout options. We take each in turn.

#### *3.2.1. Investment rules*

Investment rules in mandatory funded schemes take several forms including asset class limits and minima, issuer limits and concentration limits. The rules also specify valuation and reporting of investment practices and results. Regulations that restrict the way pension funds exercise shareholder rights could also be included in this category. Other important issues include corporate governance rules for the pension fund administrators and the use of custodians.

All of the systems generally require market valuation of assets and these are reported daily. There are exceptions, however. Due to the illiquidity of certain assets or lack of secondary market trading, some assets require special valuation procedures. Examples include consumer loans in Uruguay and the bonds issued by the social security institute to finance accrued rights in El Salvador.

Some countries also allow book values to be carried for certain bonds. In Uruguay several bonds fall into this category<sup>34</sup>. These practices reduce observed volatility and, in extreme cases, mask default risk.

Countries with mandatory, private DC schemes usually impose explicit portfolio limits<sup>35</sup>. Appendix tables A.2-A.6 show these limits by type of asset and issuer for eleven countries in 2002. The tables show significant variation. With regard to domestic assets, for example, shares are not allowed in several countries while others allow as much as forty percent. Corporate bond limits are higher with an average limit of about fifty percent. Limits on government debt are much higher and range from 40 to 100 percent with most countries at the upper end of the spectrum. Derivatives are allowed in three countries, but only in significant amounts in Chile.

The individual asset class limits in themselves provide only partial information as to their impact on investment policy for three reasons. First, the limits must be viewed in the aggregate to see what flexibility pension funds have to invest. If the sum of the limits is 100% for example, the asset allocation is effectively defined. Second, even where limits allow flexibility, the limitations of domestic supply of instruments is often the binding constraint. Third, there may be requirements to invest a minimum proportion of funds in certain assets that override these limits.

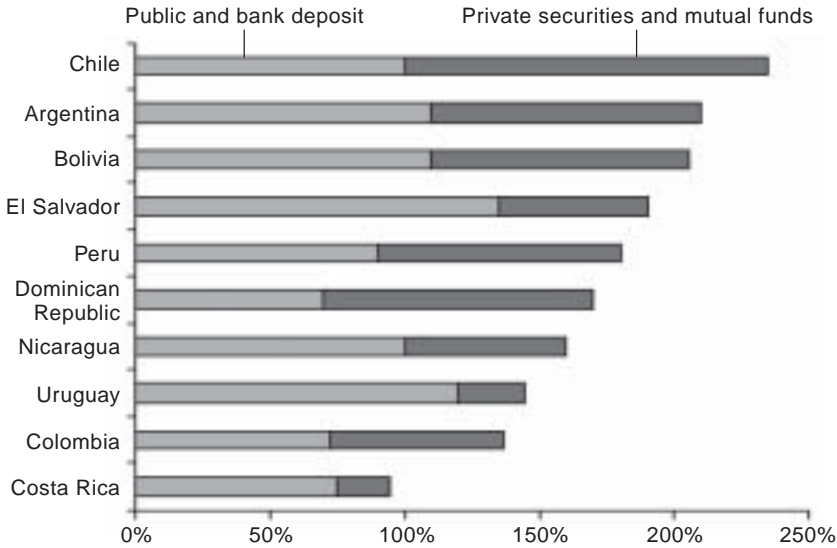
Addressing the first point, Figure 5 looks at a particular combination of asset limits that are important in most countries. The bars add up the maxima for two groups of domestic asset classes - government securities and bank deposits on the one hand and private securities (excluding those issued by financial institutions) and mutual funds on the other. Within these asset classes, Chile provides the most flexibility and has the highest proportion on private securities and mutual funds. At the other end of the spectrum, Costa Rica and Uruguay provide the least flexibility and have the most restrictive limits.

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<sup>34</sup> The 'bono global' is an example. Maturing in 2027, it may represent 20 per cent of the portfolio.

<sup>35</sup> Australia and Sweden are notable exceptions.

**Figure N° 5**  
**PORTFOLIO LIMITS COMPARED FOR 10 COUNTRIES**



Source: See Appendix, Tables A.2-A.6 for details and sources.

The case of El Salvador helps illustrate the last two points. Despite a relatively high limit on corporate bonds of fifty percent of the portfolio, the supply of these instruments is very small and therefore, the constraint is not binding. On the other hand, the pension funds are mandated to buy two non-tradeable assets –special bonds and paper issued by the national housing bank– which together will represent more than half of the total investments for the next few years. In other words, due to mandates and the scarcity of domestic investment opportunities, the regulated portfolio limits are a secondary factor.

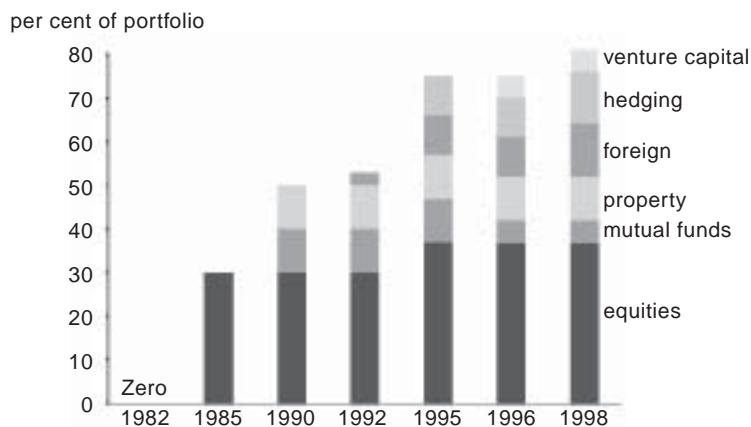
Solis (1999) and Srinivas and Yermo (1999) argue that portfolio limits result in lower risk adjusted returns and therefore, lower benefits. While recognizing the potential for these effects, Valdes-Prieto (2000) disputes the empirical evidence presented by Srinivas and Yermo and cites contradictory evidence from other studies. More importantly, argues Valdes-Prieto, limits may be necessary for reasons particular to the initial conditions of the reform in each country.



Valdes-Prieto (2000) highlights the rationale for placing heavy restrictions on equity investments during the first five years of the Chilean system. As he points out, the possibility that pension funds would have been used to prop up an insolvent banking sector at the expense of workers justified transition rules with regard to investment. No doubt similar situations will arise in other countries and may justify temporary restrictions. The danger is that the long-term vision of what the investment policy for this sector should look like may be forgotten and that unlike Chile, the rules may not evolve in the right direction.

The gradual liberalization strategy that has characterized Chile over the last two decades, shown in Figure 6 below, requires a long term vision based on principles of diversification. It avoids government mandates for ‘social investments’ or economically targeted investments (as those cited in the case of El Salvador above). The danger is that governments will manipulate the private pension funds in order to achieve objectives not related to pension provision<sup>36</sup>.

**Figure N° 6**  
**SUM OF LIMITS ON VARIOUS ASSETS IN CHILE, 1982-1998**



Source: World Bank, Pension reform primer note on portfolio limits.

Note: “Property” here refers to investment funds that invest in real estate.

<sup>36</sup> In fact, one of the key reasons for the new model is to minimize this threat through individual accounts that align the interest of members with commercial investment policy, something that has not been possible under partially-funded, public pension reserves. See Iglesias and Palacios (2000).

As funds accumulate, there are two options for increasing the universe of investments in the interests of plan participants. The first is to develop domestic capital markets and is therefore beyond the scope of what can be done through changes to pension regulations. The second is to allow for a greater proportion of the pension funds to be invested abroad. This is subject to change through regulation by the authorities.

Table A.3 describes the foreign investment limits in each country. However, these limits are subject in most cases to the approval of monetary authorities who are responsible for exchange rate policy. In the case of Bolivia for example, regulations state that up to fifty percent of the portfolio can be held in foreign securities. However, until 2002 these investments were prohibited. Similar restrictions have prevented Peruvian pension funds from increasing their foreign exposure.

The arguments for investing abroad are well known<sup>37</sup>. Although ‘home bias’, the tendency to invest more domestically than what would have been efficient based on an analysis of risk and return has been cited in the literature, this is generally based on evidence from countries with highly developed capital markets<sup>38</sup>. Moreover, the trend has been towards more foreign investment in most of these countries during the last decade<sup>39</sup>.

The ‘home bias’ phenomenon does not seem to be relevant for the pension reforms in Latin America. The gains in terms of diversification are especially clear in those countries with very limited domestic capital markets. While investment in dollar-denominated assets is prevalent in some countries (e.g., Bolivia and Uruguay), this addresses only exchange rate risk. Restrictions on purchasing foreign issued securities closes an important option for rapidly growing pension funds limiting their ability to diversify across sectors, instruments and, especially country-specific risks. In short, the case for increasing foreign investment is compelling<sup>40</sup>.

Whether domestic and foreign limits will be relaxed appropriately as assets grow and whether these limits will be based on sound

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<sup>37</sup> For applications in the context of Latin American pension reform, see Siandra (1999) and Tarzajan (2002).

<sup>38</sup> See OECD (1998), for a discussion.

<sup>39</sup> Phillips and Drew (2002).

<sup>40</sup> This topic is revisited in Section 4.

analysis is an important question and the answer will be crucial to determining the performance of the new systems. A more fundamental question is whether limits should be a permanent feature of the new systems. The alternative to asset class restrictions is overall limits on total risk of the portfolio or the prudent person rule.

Limits are usually justified on the basis of three public policy objectives. First, there is typically a desire, often unstated, to limit the dispersion of outcomes for equivalent workers. (Relative return guarantees are another example of a policy designed for this purpose.) Second, there is a desire to limit downside risk, even at the expense of average returns. (A similar philosophy is inherent in other features of the system such as sole purpose providers, which imply a tradeoff between potential conflicts of interest and administrative costs.) Third, there may be moral hazard problems when a minimum pension guarantee exists and the absence of limits would increase the option value for an individual that chose a riskier portfolio.

The prudent person investment approach would not address these issues and its effective application requires a robust legal system that is absent in most countries. On the other hand, placing limits on the overall risk level of the portfolio could address all three concerns. The recent changes to the Mexican investment regulations are an example of a shift in this direction (see Appendix Table A.4). Over time, the actual limits could be based on an explicit policy with regard to dispersion of benefit levels and downside risk desired based on the experience of the risk adjusted returns or proxies. Value at risk measures could be applied rather than asset class limits that reduce flexibility and market competition. Regulators in several countries are studying the Mexican precedent at the moment.

Another innovation in the design of investment rules is the recent introduction of multiple portfolio options in Chile<sup>41</sup>. Introduced in 2002, the multifondos concept is also likely to emerge in other countries like Mexico<sup>42</sup>. Table 4 shows the range of portfolios available in Chile along with the available allocation by age.

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<sup>41</sup> A second fund was actually introduced earlier in 1999 although take-up was low.

<sup>42</sup> Portfolio choice of this kind already exists in other countries with mandatory defined contribution schemes such as Sweden and Hong Kong.

Detailed portfolio limits are shown in Appendix Table 20. Note that for those already participating in the system, Fund C is the choice that maintains the portfolio allocation applied under the single portfolio regime.

There are clearly potential gains for members of the system now able to customize their portfolios according to their own risk tolerances. There may also be benefits in terms of product differentiation that leads to more competition. However, Valdes-Prieto (2002) has criticized the default on the basis that age is only one of many factors that affect risk aversion. Also the tendency for individuals to rely on the default effectively takes the pension fund manager off the hook in his role as intermediary, reducing one of the potential benefits of the system - the presence of intermediaries with expertise and lower information costs.

While there has been a surprisingly high level of interest expressed by affiliates during the initial period of portfolio selection, it is difficult to assess the extent to which individuals clearly understand their options. Studies of participants in the US 401(k) program where portfolio choice is available suggest that information costs are high for individuals and that there is a strong tendency to accept the default option (the option individuals are assigned when the choice is not made) where one exists. Survey results in Chile suggest that even after 22 years, there are large

**Table N° 4**  
**PORTFOLIO OPTIONS BY AGE IN CHILE'S**  
**'MULTIFUNDS' SCHEME**

	Men	under age 55	aged 56 and above	Pensioners with scheduled withdrawals	Max/Min limits in variable income
	Women	under age 50	aged 51 and above		
	Fund A	✓			80/40
Investment	Fund B	✓	✓		60/25
Options	Fund C	✓	✓	✓	40/15
	Fund D	✓	✓	✓	20/5
	Fund E	✓	✓	✓	0/0

Source: SAFP (2002).

knowledge gaps with respect to the pension system among its affiliates<sup>43</sup>.

### 3.2.2. Charge structures and limits

There are rules in each system as to how charges are levied for the services provided by the pension fund managers. Again, there is significant variation across countries, as shown in Table 5. While all countries allow or in some cases require charges on contribution flows, only Mexico and Nicaragua allow an asset-based charge. Costa Rica, Mexico and the Dominican Republic allow charges based on returns. Half of the countries place some kind of cap on the commission. In El Salvador and Colombia, the cap applies to the sum of insurance and net charges.

**Table N° 5**  
**REGULATIONS ON CHARGES**

	Type of charge allowed or cap exists					
	Flat charges	Contribution based	Asset based	Returns based	Loyalty discounts	Caps on fees (or contract)
Argentina		X			X	
Bolivia		X				X <sup>1</sup>
Colombia		X				X <sup>2</sup>
Chile	X	X				
Costa Rica		X		X		X
Dominican Republic		X		X		X
Ecuador		X				
El Salvador		X			X	X <sup>2</sup>
Mexico	X	X	X	X	X	
Nicaragua		X	X		X	X
Peru		X			X	
Uruguay	X	X			X	

<sup>1</sup> Charges are agreed as part of the contract for the concession.

<sup>2</sup> The cap is on total of insurance and commission charge.

<sup>43</sup> The Chilean Superintendency of Pensions has attempted to remedy this situation by mandating the provision of certain types of information and there are parallel efforts at education starting as early as high school. On the other hand, the current system of classifying the five portfolio choices in the system that relies exclusively on the proportion of variable versus fixed income instruments may not contribute to improving this understanding. Specifically, current 'riskiest' portfolio option is also the one in which the highest proportion of foreign securities is allowed. Given the potential diversification gains from investing abroad, this may be misleading.

Iglesias (2001) cites the desire for transparency, ease of administration for employers, adaptability to changing cost structures of the providers and finally, subsidies for lower income workers as motivating the restrictions. He also notes that some of these rationales are mutually incompatible. Whitehouse (2000) illustrates how different charge structures can affect the stream of commissions over the accumulation period. This has implications both for the projected net returns for the individual as well as for the revenue stream for the pension fund manager as shown in Figure 7. Clearly the reliance on contribution based charges brings forward commission flows relative to the asset based charges.

Cross-subsidies are produced by charge restrictions when firms are not able to differentiate prices for individuals that represent very different marginal costs to the provider. There are costs associated with administering any individual account, but restrictions that prohibit fixed annual charges or a commission based on assets or returns force a subsidy from active contributors to those with dormant accounts<sup>44</sup>. Cross-subsidies are also due to rules that prohibit differentiation of charges for groups and for individuals with accounts of different sizes. One exception to this uniform charge rule is discounts for persistence or 'loyalty'.

Some cross-subsidies may redistribute in favor of low-income workers. This is the case for example, when firms are forced to charge uniform rates or when fixed charges are prohibited. It also is likely to occur when charges are on flows and there is a strong correlation between contribution density and lifetime income level. However, not all workers with an incomplete contribution history are low income, so there are leakages. Moreover, there are more direct forms of subsidy to low income individuals.

Another argument in favor of rigidity in charge structures is to promote transparency. While there is little empirical evidence suggesting more price competition in systems with more transparent charge structures, there are concerns about the ability of individuals to compare different charge structures. The complexity of this comparison, the conclusions of which vary according to several

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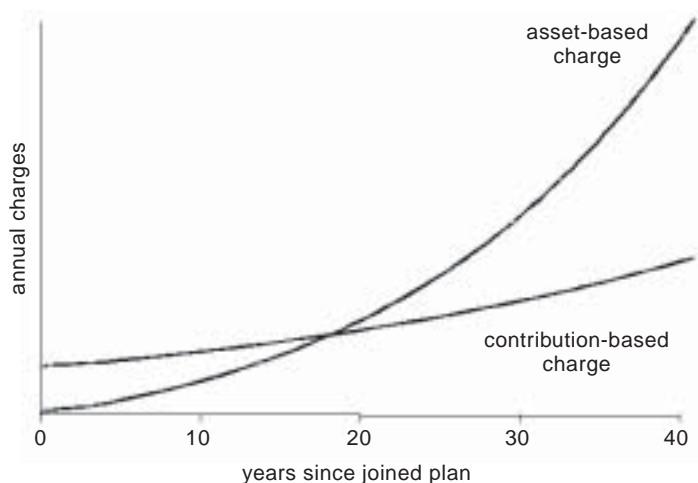
<sup>44</sup> Age-related cross-subsidies also exist including from workers to those receiving scheduled withdrawals and within the disability and survivors insurance scheme where risks are systematically higher for older workers. Disability also involves cross-subsidies to lower income workers.

variables, has led the supervisor in Mexico for example, to publish standardized tables comparing commissions.

The main concern regarding charges is due to the potential impact charges can have on net returns and ultimately, on the pension level achieved (see Section 4.2.2). Proposals to address the issue fall into two categories - generate more competition or restrict not only structure but also the level of charges.

Examples of proposals that fall into the first category are to maintain the simple charge structures but allow for limited competition based on group discounts<sup>45</sup>, to allow other financial sector participants to offer pension fund services and to otherwise reduce barriers to entry and finally, increased consumer awareness of charges. In Mexico and Argentina, an additional incentive is used. Individuals who do not choose a provider are assigned to those with the lowest charges<sup>46</sup>.

**Figure N° 7**  
**TIME PROFILE OF PAYMENTS OF DIFFERENT TYPES OF CHARGE**



Source: Whitehouse (2000).

Note: Contribution based charge is on flows and assumes real earnings growth.

<sup>45</sup> See Mastrangelo (1999).

<sup>46</sup> This was introduced in Mexico by CONSAR in 2002.

The second approach involves controlling charges directly. This takes various forms in the five countries that apply caps<sup>47</sup>. In Colombia, El Salvador and Nicaragua the limit is on the sum of the insurance premium for disability and survivors coverage and the commission. Where it has been applied, all providers have tended to charge the maximum. In Costa Rica, the charge was on returns and the ceiling was originally set at eight percent in nominal terms and this was charged by almost every provider. This ceiling was raised in 2003 and a contribution-related charge was added, also with a limit. Finally, in the Dominican Republic, managers are allowed to charge up to 0.5 percent of covered wage plus a percentage of returns above the benchmark rate as well as one percent for insurance.

Setting limits is largely a reaction to what is often perceived as a weak relationship between costs and commissions. The potential for oligopolistic behavior is especially acute in markets that are small in terms of affiliates and assets and aggravated by barriers to entry. But it is clear that limits will always be somewhat arbitrary. If it is low, it may discourage potential players from entering the market, exacerbating market concentration. If it is too high, it may be considered the sanctioned norm and simply legitimize the oligopolistic behavior. Low ceilings might also result in a loss for consumers willing to pay for better service.

A popular if less direct way to intervene in the market is to attempt to reduce costs by restricting the number of times that an individual can switch from one fund to another. This type of restriction is based on the assumption that higher marketing costs due to sales commissions are passed onto consumers in the form of higher charges. The restrictions seek to reduce marketing expenses by reducing the potential number of transfers. All countries restrict transfers, usually by specifying the number of months an affiliate must have contributed or maintained his account at the pension fund before switching. The time periods range from 2.5 months in Chile to once a year in several countries (see Appendix Table A.6). The risk in limiting competition is that it contributes to inertia and a lack of competition without necessarily reducing charges. In

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<sup>47</sup> The Bolivian approach is based on international bidding for a concession whereby the criteria included in the selection process include commission levels. While the case is interesting, it took place under unique circumstances that make comparisons with other countries difficult.



fact, since these restrictions ensure a longer period of membership and therefore a larger stream of revenues, marketing expenses may increase in the form of higher commissions paid to agents per transfer, even if these are less frequent.

### 3.2.3. Withdrawals

Most of the energy of regulators has been focused on the accumulation period. This is not surprising given that there are very few pensioners in any country except Chile. Nevertheless, adequate savings at retirement age is an intermediate step toward the ultimate goal. The objective of mandatory pension systems is twofold - to avoid a sudden sharp drop in consumption levels and to protect against poverty in old age. The provision of effective longevity insurance or at least to spread out payments during old age is important for both objectives. For these reasons, withdrawals in most mandated, defined contribution schemes are restricted<sup>48</sup>.

**Table N° 6**  
**REGULATIONS ON WITHDRAWALS**

	Life annuity (LA)	Scheduled withdrawal (SW)	Combined LA and SW or deferral	Lump sum above minimum	Variable annuity
Argentina	X	X	X	X	X
Bolivia	X	X			X
Colombia	X	X	X	X	
Chile	X	X	X	X	
Costa Rica	X	X	X		
Ecuador	X	X			
El Salvador	X	X	X	X	
Mexico	X	X	X	X	
Nicaragua	X	X	X	X	
Peru	X	X	X	X	
Uruguay	X				

Source: Devesa-Carpio and Vidal Melia (2002); Palacios and Rofman (2000).

<sup>48</sup> Exceptions are Australia and Hong Kong.

While all systems in Latin America restrict withdrawals upon retirement, the options provided and the way they are regulated vary. As shown in Table 6, all schemes allow life annuities and all except for Uruguay allow for scheduled withdrawals<sup>49</sup>. Many allow for either a combination of scheduled withdrawals or deferral of the annuitisation decision. Only Bolivia and Argentina allow variable annuities and in the latter case, this is subject to a minimum interest rate condition. A proposal in Parliament in 2003 is expected to introduce variable annuities in the Chilean scheme in 2004.

Another important design consideration is the possibility of withdrawing funds for other reasons when the pension that is delivered by the scheme already meets public policy objectives. Allowing some flexibility in this regard is justified given diverse circumstances of those retiring in terms of their other assets, desires for bequest and other uses for savings, like health. Also, the possibility that mortality is correlated to lifetime income level may lead to undesirable redistributive consequences with overannuitization.

Table 7 below shows the policies adopted by each country in this regard. The approaches can be grouped into four types. The first group, which includes Argentina, Colombia, Chile, Nicaragua, and El Salvador, have specified targets that refer to both the consumption smoothing and poverty objectives of the scheme. A second group including the Dominican Republic and Mexico omits reference to own wages, but does specify a minimum target level. However, it is interesting to note that the amount in the former is below the minimum pension. Peru specifies a minimum relative to the worker's own earnings, but as of yet there is no minimum pension for new entrants. Finally, several countries including Bolivia, Costa Rica and Uruguay do not allow for any lump sum withdrawals.

This is particularly striking in the case of Costa Rica and Uruguay where, as was shown earlier, the overall benefits are the highest and are mostly in the form of a defined benefit scheme that provides indexed pensions. Combined with the prohibition on scheduled withdrawals in Uruguay, the annuitisation target appears

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<sup>49</sup> Timing risk with regard to interest rates has been cited as a possible problem. This risk can be mitigated by deferral or a combining a scheduled withdrawal with annuity.

**Table N° 7**  
**ANNUITY EQUIVALENT BENEFIT REQUIRED**

	<b>Percent of own wage</b>	<b>Percent of minimum pension</b>
Argentina	70	300 <sup>1</sup>
Bolivia		
Colombia	70	110
Chile	70	120
Costa Rica		
Dominican Republic	none	50
Ecuador		
El Salvador	70	160
Mexico	none	130
Nicaragua	60	160
Peru	80	Na
Uruguay		

Source: Devesa-Carpio and Vidal Melia (2002);

<sup>1</sup> Percent of PBU.

to be extremely high by any benchmark. In contrast, the Bolivian system has a modest implicit benefit target and no minimum pension guarantee.

A final consideration on the old age benefit payout design has to do with regulations that affect the pricing of the different products available. For scheduled withdrawals, this is related to the formula specified by regulators. Here an important design choice is the technical interest rate that is used to generate the stream of payments in the scheduled withdrawal. If this rate is too high, the funds may be exhausted quickly while the opposite could overcompensate and reduce consumption unnecessarily.

Annuity rules are even more problematic. In those countries where regulations exist, there are questions regarding the underlying mortality data<sup>50</sup>. Several countries that allow

<sup>50</sup> For a detailed discussion of these points regarding Argentina, Colombia, Chile and Peru see Palacios and Rofman (2000).

annuities do not have detailed regulations or actuarial tables to implement this policy. The dearth of data and low coverage will make it difficult to create the technical basis for such regulations. Costa Rica, Dominican Republic, El Salvador, and Nicaragua will have to confront this challenge in the coming years. Costa Rica has recently produced a set of life tables for this purpose but has yet to issue the relevant regulations.

#### *3.2.4. Reporting and disclosure*

An important feature of the regulatory framework in the Latin American schemes is an emphasis on transparency. This emphasis is manifested in various ways ranging from the single purpose provider design to the simple and uniform charge structures that are common in many of the countries. There is also a strong emphasis on reporting to members with most supervisors requiring at least two account statements per year. Special rules on advertising and qualifications for sales personnel are common.

#### *3.2.5. Disability and survivors insurance mandates*

With the exceptions of Mexico and Costa Rica, managers are mandated by law to provide group insurance for disability and survivors for their members. This is typically purchased through a group insurance contract and charged to the contributor. In steady state, the cost of this insurance will depend on disability and mortality incidence among members of the scheme, rates of return, contribution density and the benefit formula.

Grushka (2003) illustrates the relationship between the key determinants of steady state disability and life premia in a hypothetical funded scheme. Abstracting from the transition period and market conditions in particular countries, Grushka calculates the sensitivity of the premium to changes in some of the key variables. The results are shown in Table 8 below. The table shows 11 scenarios with different combinations of benefit levels, contribution histories and investment returns. For example, an increase in the investment return of two percentage points reduces the steady state premium by one third while a reduction in the contribution rate to the individual account from 10 to 7.5 percent increases the premium by 16 percent. A reduction in the replacement rate from 70 to 50% (moving from the base case to scenario 1) reduces the equilibrium premium by almost half.

The last factor is clearly a matter of system design. The benefit for full disability countries ranges from 35-70 percent for full disability and there is further variation in the earnings base that is used for calculating the benefit (see Appendix Table A.8). Other design issues include how long coverage lasts since the last contribution has been made. The implied cross-country differences in equilibrium premiums can be significant. When consideration is given to different transition arrangements (e.g., valuation of recognition bonds), it becomes clear that cross-country comparisons of these costs are extremely tenuous. It also shows that the costs are a function of design choices as well as the institutional arrangements that may affect disability rates (see below).

Aside from comparing the systems, further analysis is necessary in order to assess the degree of competition in this market. It is clear, for example, that there is a tendency for pension fund managers to purchase coverage from related firms<sup>51</sup>. The question is to what extent this undermines competition and allows AFPs and related insurance firms to engage in tax arbitrage or other undesirable practices.

**Table N° 8**  
**DETERMINANTS OF LIFE/DISABILITY PREMIUM IN STEADY STATE**

Case	Replacement rate	Survivorship pension	Investment returns	Contribution rate	Contribution density	Cost (% of wage)	Differ. with base case
	%	%	%	%	%		%
Base	70	70 (49)	4	10	70	2.32	
1	50	50 (35)				1.19	-49
2						1.92	-17
3	50	50 (25)				1.02	-56
4		0				1.51	-35
5			2			2.80	21
6			6			1.53	-34
7				12.5		1.95	-16
8				7.5		2.69	16
9				0		3.81	64
10					60	2.53	-9
11					80	2.11	-9

Source: Gruschka (2003).

<sup>51</sup> See Palacios and Rofman (2000).

### 3.2.6. Guarantees

There are four types of guarantees in the funded scheme that result in a contingent liability for the funded pension system<sup>52</sup>. The first two relate to the accumulation stage while the last two apply during the payout phase. These are:

- Absolute return guarantees
- Relative rate of return guarantees (sector and benchmark-based)
- Guarantees on benefit payouts
- Minimum pension guarantees

Table 9 shows that only two countries use absolute return guarantees. It should be noted that these apply to the state-run managers. Although the real return that is guaranteed is relatively low at two percent, it still introduces an extra distortion in the market since private providers do not have to provide it. In contrast,

**Table N° 9**  
**GUARANTEES IN FUNDED SCHEMES**

	Absolute rate of return guarantee	Relative rate of return guarantee	Benefit payout guarantee	Minimum pension guarantee
Argentina	X	X	X	
Bolivia				
Colombia		X		X
Chile		X	X	X
Costa Rica				
Dominican Republic		X		X
Ecuador				
El Salvador		X		X
Mexico				X
Nicaragua		X		X
Peru		X	X	
Uruguay	X			

Source: Country legislation; FIAP survey.

<sup>52</sup> Heller (1999) argues that there are inherent implicit guarantees in addition to these explicit ones. In fact, one rationale for the MPG would be to provide the equivalent of deposit guarantee for the banking system in order to avoid the type of open-ended liability to which Heller refers.

relative rate of return guarantees are found in every country except Bolivia, Costa Rica and Mexico. The intention of this type of guarantee is to limit variability in outcomes due to extreme cases of poor performance by providers. In the long run, it also serves to limit variability across cohorts, effectively smoothing returns over time. These guarantees are typically triggered by significant underperformance of one pension fund relative to the sector and financed from special reserves with the state as the ultimate guarantor in case of failure<sup>53</sup>. Some analysts have expressed concern that this leads to ‘herding’ by penalizing individual managers that deviate from the average portfolio. To the extent herding exists, it will be greater the narrower the band of the guarantee<sup>54</sup>.

**Table N° 10**  
**RULES FOR MINIMUM PENSION GUARANTEE FOR OLD AGE**

	Ratio MPG to average covered wage	Anchor or method for MPG level	Eligibility or vesting rule	Contribution to individual account
	Per cent		years	Per cent
Argentina	28 (PAYG)	n.a.	30.	7.7
Bolivia	(Bonosol)	n.a.	n.a.	10.0
Colombia	50	Minimum wage	25	10 (12) <sup>5</sup>
Chile	25	Discretionary	20 <sup>1</sup>	10.0
Costa Rica	20 (PAYG)	N/A.	n.a.	4.25
Dominican Republic	41	Minimum wage	30 <sup>2</sup>	8.0
Ecuador	n.a.	n.a.	n.a.	Varies
El Salvador	32	Discretionary	30 (25) <sup>3</sup>	10
Mexico	23	Real 1997 mw	24 <sup>4</sup>	7-12
Nicaragua	6	Real min pen	25 <sup>1</sup>	7.5
Peru	None	None	N/A.	8.0
Uruguay	20 (PAYG)	N/A.	N/A.	Varies

Source: Devesa-Carpio and Vidal Melia (2002); Palacios and Rofman (2000); FIAP survey.  
1) 65 for men, 60 for women; 2) Age 60; 3) 25 years for male at age 60, woman at age 55;  
4) Age 62; 5) Rising to 12 by 2008;

<sup>53</sup> In Colombia, a financial sector insurance fund is tapped in case manager reserves are exhausted. Colombia is also unique in using a combination of sector and asset benchmark indices in its version of the relative guarantee. The validity of the specific benchmarks used in this case appears to have flaws and may actually impede performance if not corrected according to Solomon Smith-Barney (2002).

<sup>54</sup> For a comparison of relative return bands, see Devesa-Carpio and Vidal Melia. (2002), Table XIX.

Finally, benefit payout guarantees exist in several countries and will become more important in the future, especially in countries where annuity providers find it difficult to match long term, indexed liabilities with appropriate assets.

The most important of the four guarantees related to the funded scheme, both in terms of direct social effects as well as fiscal consequences, is the minimum pension guarantee (MPG). Table 10 shows that MPGs are applied in every country that does not have a residual, public defined benefit component except one, Peru. The value of the guarantee differs across countries for several reasons. The most important in terms of design<sup>55</sup> are (i) the ratio of the minimum pension to the average covered wage, (ii) the eligibility conditions or vesting rules and (iii) the size of the contribution to the individual account. In Table 10, these three indicators are shown for the six countries that have MPGs (shaded) along with the method for setting the level of the minimum where relevant.

The table illustrates the point made earlier that redistribution is perfectly feasible in a funded system. In fact, relative minimum pension levels are often higher than their equivalents in the pay-as-you-go scheme. While no there is no MPG in Bolivia, in principle, the universal flat benefit provides some safety net. In this regard, Peru stands out due to the lack of any minimum pension guarantee<sup>56</sup>. It also highlights differences in the ratio of contribution rates to the MPG levels. Where the MPG is high relative to the contribution rate as in the Dominican Republic, a high proportion of workers will receive the MPG.

An important flaw in the design of the MPG is the method by which its level is determined<sup>57</sup>. In most cases, this is discretionary or tied to the minimum wage, which is also discretionary. In Mexico and

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<sup>55</sup> Obviously, the distribution of wages and the average number of years spent in the formal sector and relationship between net returns and growth of wages will lead to different MPG costs. This point also illustrates the link between MPG liabilities and the investment regime. The government is essentially providing a rate of return guarantee the value of which will depend on the individuals own circumstances. The value of the guarantee will be high in the case of low income workers that contribute for the minimum vesting period,

<sup>56</sup> The existing guarantee applies only to older workers.

<sup>57</sup> Another problem is one shared by PAYG minimum pensions, namely, the 'cliff vesting' rules wherein full benefits accrue suddenly. This can result in perverse incentives and redistribution. This problem could be rectified to some extent through pro-rating of the minimum pension in both cases.



effectively in Nicaragua, it is set in real terms. The first method results in increased uncertainty both with regard to the size of the unfunded liability and the ex post redistributive outcome. If the minimum pension is anchored to the minimum wage, for example, cohorts retiring in different periods are likely to receive arbitrarily different subsidies because the minimum wage can vary significantly over time. Also, in any given year, the minimum wage may bear little relationship to official measures of the poverty line. Indeed, the ratio of minimum wage to poverty line varies widely across countries (as illustrated in Appendix Table 21).

A better anchor for the MPG would reflect the absolute or relative poverty objectives of the system. For example, the target might be set in terms of a subsistence basket of goods or a relative poverty standard such as a certain proportion of median income per capita. It is important that the objectives of the MPG be made explicit, especially when it is financed by the central government in competition with other programs that address poverty and which are not restricted to the formal labor force.

Another alternative to the minimum wage anchor would be to set the MPG as a share of the average covered wage. This combines the objective of making the policy with regard to redistribution less arbitrary and also links the minimum pension to the growth of earnings above the minimum wage. This would allow for more accurate calculations to see (i) how big will the subsidy be and (ii) what percentage of workers will eventually rely on the MPG. This will help make it clear that when contribution rates to individual accounts and other parameters are not consistent with the level of the MPG, the system will not perform as desired. If the MPG is too high to be affordable or to avoid distortions in the labor market, difficult changes may have to be made. If the MPG is too low and gradually ceases to serve its redistributive function, as may be the case when it is anchored only to inflation, there may be pressure to raise it suddenly.

### **3.3. Institutional arrangements**

Section 3.2 dealt with the rules for the accumulation and payout phases. These rules are followed, implemented and enforced by five different actors - the affiliates, the contribution collector, the pension fund managers, the annuity providers and the supervisors. The institutional arrangements that delineate the activities of each

of these actors differ from country to country are important determinants of system performance.

All of the Latin American reforms are based on individual or personal plans as opposed to occupational plans<sup>58</sup>. They also have in common a reliance on specialized or sole purpose providers. The most important differences lie in how contributions are collected and the organizational features of the supervision. Also significant in defining the role of the state in the system is the assignment of institutional responsibility for disability to the public sector in some countries and the presence of state owned pension fund managers. Table 11 highlights some of these differences.

### 3.3.1. Contribution collection

There are broadly three options as to how to organize the flow of information and money of the new pension schemes. The

**Table N° 11**  
**COMPARISON OF INSTITUTIONAL ARRANGEMENTS**

	Centralized collection	State-owned manager	Disability only in PAYG scheme	Specialized supervisor
Argentina	X	X		X
Bolivia				
Colombia				
Chile				X
Costa Rica	X	X	X	X
Dominican Republic	X <sup>2</sup>	X		X
Ecuador	X		X	
El Salvador				X
México	X <sup>1</sup>	X	X	X
Nicaragua	X			X
Peru				
Uruguay	X	X		

Source: Country sources and FIAP survey.

<sup>1</sup> Private ownership by industry

<sup>2</sup> Public/private partnership according to functions

<sup>58</sup> The mandatory private systems in Switzerland and Hong Kong are based on an employer-mandate and occupational schemes play an important role in Australia and the United Kingdom. Costa Rica is the only Latin American system with mandatory private pension coverage that allows closed group funds and these are very limited. Voluntary occupational funds are important in Brazil.

decentralized model requires employers to provide information and pay contributions on behalf of their workers directly to the specialized providers. The centralized model can rely on a public (Costa Rica) or a private entity (Mexico) for collection and record keeping. A fourth variant, unique to the Dominican Republic, is to divide functions of registration, collection, recordkeeping, etc. between public and private sector.

Seven of the twelve countries have opted for centralized collection. This decision is often based on the argument that there are significant economies of scale that will help reduce the cost of the system overall. To date however, we are not aware of any study documenting these savings or comparing performance measures. This is an area that merits further research both on the costs and benefits of centralized collection as well as the possible use of new technology, including the Internet.

Two of the countries –Costa Rica and Uruguay– continue to collect contributions through the old public pension system and this is also planned in Nicaragua. This may seem natural in that the CCSS and BPS continue to play a role in pension provision and must collect contributions from all members of the funded scheme in any case. On the other hand, the problems of starting up a new, untested system are exacerbated in many countries by the dismal state of databases and information technology in general in the old system. For example, the new collection and record-keeping system in Costa Rica has been the subject of much criticism following major implementation problems<sup>59</sup>.

An alternative to a public monopoly was adopted in Mexico. In this model, the pension fund managers are the shareholders in the centralized agency set up as a non-profit firm to handle contribution collection. In the Dominican Republic, a hybrid solution is being tested involving a public-private partnership as the system gets under way in 2003.

Efficient and timely collection of contributions is a crucial function for any pension system, but can be even more of a challenge for decentralized, defined contribution schemes. There is little research comparing the advantages and disadvantages of the

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<sup>59</sup> Based on interviews with officials and industry in 2003.

options available and even less based on empirical analysis. Problems are, not surprisingly, most daunting when the system is first launched. The initial months have regularly been characterized by confusion and contributions that cannot be placed in accounts. This has led to the phenomenon of ‘rezagos’ which can represent several percentage points of assets in the system<sup>60</sup>.

### *3.3.2. Disability and survivors insurance*

In three of the twelve countries, disability insurance continues to be provided by the public, PAYG scheme. In Ecuador and Costa Rica, this is related to the presence of a large, residual public scheme and a correspondingly low contribution to the individual account. In Mexico however, the disability premium is the only part of the earnings-replacement scheme that is not privatised. The premium charged is significantly higher than that found in other countries despite lower benefit levels (see Section 3.2.4). There is no obvious rationale for this practice.

Grushka (2003) describes the institutional arrangements for eligibility determination in the reformed Latin American countries (see Appendix Table A.7). Alternative models of organization are used to qualify disability. He cites the following possible arrangements.

- Independent Medical Commissions (as in Argentina, Chile and Colombia);
- Life insurance companies (as in Bolivia);
- Pension Funds Managing Companies (as in Peru);
- Pre-existing Social Security agency (as in Mexico and Uruguay);
- Pension Funds Supervision Agency (to some extent, in Argentina);
- Another public agency (no case reported).

Reviewing the various approaches, Gruschka points out that there are inevitably conflicting incentives involved with each. For example, insurers and pension fund administrators are interested in reducing disability rates while public agencies with no financial stake may be too lax. Historically, there has also been evidence of

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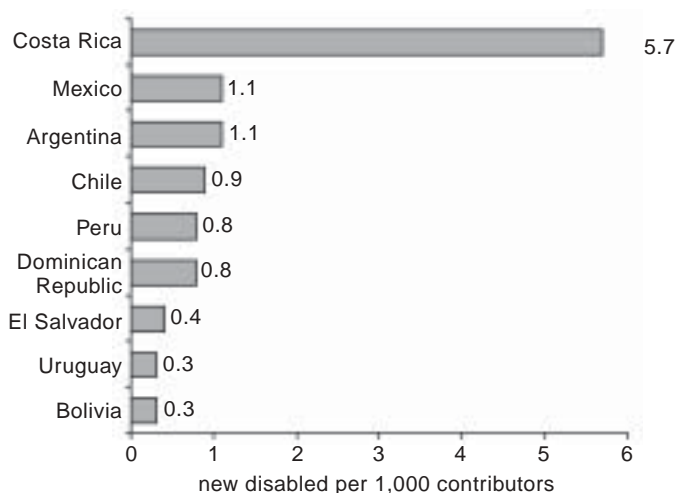
<sup>60</sup> Many systems in Latin America have reported unclaimed balances known as ‘rezagos’ due to these start up problems. In Poland, where the old pension institution was used for collecting contributions, less than five percent of contributions were accounted for during the first six months.

the use of disability benefits as a substitute for unemployment or early retirement. The most notable case among the reformed countries in this regard is Costa Rica<sup>61</sup>.

The excessive rates in Costa Rica where pensions are still determined by the public agency stand out in Figure 8 below. Disability rates in Mexico where the public agency also determines eligibility are also relatively high when the young structure of the population is taken into account. This may be due to the fact that older workers were included in the reform. However, in El Salvador and Bolivia, where AFPs and insurers make the determination, have much lower rates. More than 90 percent of workers in El Salvador are in the new scheme and all workers in Bolivia were shifted. There is some tentative evidence then that the public monopolies grant eligibility more frequently than other arrangements.

The system of eligibility determination affects the disability rate which, along with the factors described in Table 8, in turn affect the insurance premium. This aspect of the design of the system has

**Figure N° 8**  
**NEW DISABILITY PENSIONS PER THOUSAND CONTRIBUTORS IN**  
**SELECTED LATIN AMERICAN COUNTRIES, 2000-2002**



Sources: Gruschka (2003) and Perez-Montas (2003).

<sup>61</sup> See World Bank (2000).

received relatively little attention in the literature despite being an important component of the total commission that is deducted along with administrative charges. More attention should be given to rationalizing this element of the new systems. Costa Rica and Mexico, where public monopolies may be linked to higher rates and charges due to continued reliance on public monopolies (the CCSS and IMSS, respectively) would appear to be candidates for second round reforms. The Costa Rican case would be more complicated however, given the fact that the only insurance company owned by the State<sup>62</sup>. In Mexico, there is little rationale for maintaining the insurance portion in the public sector and this has been noted since the original reform legislation was passed<sup>63</sup>.

### *3.3.3. Supervision*

Collection and record-keeping arrangements and the determination of eligibility for disability benefits by the public versus private sectors have measurable outcomes and should be the subject of independent study in order to quantify the tradeoffs involved. In both cases, there appears to be a role for the private sector. This is not the case with supervision where a distinct public sector presence is required and outcomes are more difficult to measure. The design choices include whether the supervisor will be specialized, the resources that will be devoted to it, the source of its financing and how the supervisor is appointed and removed.

All but four countries have elected to set up specialized supervisors for the new pension system<sup>64</sup>. Three countries –Colombia, Ecuador and Uruguay– have created specific departments within their Central Banks for this purpose while Peru includes it within the Banking and Insurance supervisor. The Bolivian supervisor covers securities, insurance and pensions. The rationale for a specialized supervisor is based on at least three key principles. First, the new private pension systems are unique in that workers are required to entrust their savings to private financial firms. Second, the long

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<sup>62</sup> In the Dominican Republic for example, a limit of one percent on the insurance premium was not considered sufficient to attract participation from private insurers. As a result, a compromise solution has been introduced based on ad hoc calculations resulting in lower benefits than what had been envisioned in the law. See Palacios (2003).

<sup>63</sup> See Solis-Soberron (1998).

<sup>64</sup> In contrast, a recent survey of OECD countries shows that specialized pension supervisors are less common than the integrated or partially integrated model. See OECD (2003), Table 1.

term nature of these savings requires a different perspective than what is typically the case for day to day regulation in other sectors such as banking. Finally, the reliance on specialized providers that are separated from other financial entities and that have very specific standards may require a specialized regulator.

There are three potential disadvantages however. First, to the extent that there are significant fixed costs involved, multiple supervisors could be more expensive. Second, there may be scarce human capital available to staff multiple regulators. (This assumes however, that supervisory staff are not fully utilized already.) Third, separate regulators may have more trouble coordinating. Defenders of the specialized regulator suggest that these concerns are exaggerated and that there are additional benefits including the diffusion of regulatory power and the ability for a pension fund supervisor to avoid conflicts of interest that may arise. One example cited is when short-term considerations affecting the solvency of banks and insurance companies are at odds with the long term objectives of the pension system<sup>65</sup>.

Finally, what does not appear in the table is the degree of independence of the pension fund supervisor, another critical element of institutional design. The process of nominating, selecting and removing the Superintendent and the financial independence of the regulator vis a vis the central budget are likely to determine whether or not even the best regulatory framework is successfully applied. The need for an independent and qualified supervisor will become even more important as pension fund assets grow exponentially over time<sup>66</sup>. At present, most supervisors owe their positions to the executive.

#### *3.3.4. State-owned pension managers*

The legislation establishing the Chilean pension system expressly prohibited participation by state-owned pension fund managers. This restriction was aimed at reducing the potential for government intervention in the market through implicit guarantees or other special competitive advantages. In addition, it is more

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<sup>65</sup> See for example, Demarco and Rofman (1998) and Ariztia (2002).

<sup>66</sup> In this respect, the experience of public pension fund management is relevant. Recently, new governance arrangements have been established that shield those responsible for investing the reserves of public pension funds. See Palacios (2002).

likely that interference in investment decisions will be a problem when the institution managing the funds is public.

Despite these concerns, five of the twelve countries have allowed participation of state-owned companies to compete with the new private pension sector. In two of these, Mexico and Costa Rica, the public pension institution entered the market, but has not been successful in attracting members. In contrast, pension fund managers owned by state banks in Argentina, Costa Rica and Uruguay are major players in the market. A similar situation is emerging in the Dominican Republic as the system begins in 2003.

A related idiosyncratic feature in Mexico is the housing sub-account. Roughly one third of the contribution to the individual account is deposited in a housing sub-account that is not managed by the private pension fund manager. Instead, is managed by INFONAVIT, a public institution that operates under completely different rules. There does not appear to be any strong rationale for this anomaly and Mexican experts have advocated that this design be changed for several years<sup>67</sup>.

### **3.4. Summary and conclusions regarding system designs**

This section has focused on design features of the twelve Latin American pension reforms. Under this general heading, we have looked at three aspects of system design - implicit benefit schedules regulations of the accumulation and payout stages and institutional arrangements.

In each case, there were many common features. The influence of the original Chilean design is evident in the proliferation of certain features such as relative return guarantees, scheduled withdrawal options, specialized firms and supervisors and minimum pension guarantees to name a few. There are also clear examples of bilateral influences such as the adoption by Ecuador of the income-based contribution originally introduced in Uruguay or the growing popularity of the centralized collection model. There are many differences, however. Mexico stands out as having eschewed the relative rate of return guarantee, introducing a matching contribution and allowing more flexible charge structures. Its innovative collection model is unique although the Dominican

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<sup>67</sup> Sales and Solis (1998).



Republic has partially emulated it. Finally, its risk-based regulation of investments may challenge asset class limits.

The analysis of implicit benefit schedules in sub-section 3.1 showed a wide dispersion in the size of the mandate. This may be a reflection of how society views the role of government in pension provision in each country. Nevertheless, the level of overall replacement rates can affect the probability that the scheme succeeds in the long run in at least two important ways:

First, the higher the overall replacement rate targets, the less important will be the role of private, voluntary pensions. This would remove an important potential source of competition for the specialized providers in the mandatory scheme and concentrate the long-term savings of the country in a smaller number of firms. Second, high target benefits imply a high rate of forced saving or taxation or both. This will only add to the list of incentives for small employers to stay in or move to the informal sector. While this effect may be marginal, it works against the system's financial and social objectives.

The mix of public and private provision was shown to vary greatly across countries due to the residual pay-as-you-go schemes and minimum pension guarantees. Workers in countries that continue to rely heavily on public DB pension promises are more exposed to policy risk and less exposed to investment risk. It is not clear that the balance in several countries is optimal for workers. In Peru for example, there is no public DB element for those with individual accounts while in Costa Rica, the private, DC generates only a small fraction of the pension and most of the risk is related to the sustainability of the old pay-as-you-go system.

Finally and related to this balance, funding ratios –the assets being accumulated relative to the liabilities being accumulated– appeared to span a large range across the twelve countries. In some of the countries where the system has been completely privatized, minimum pension guarantees set at high and discretionary levels represent a new type of unfunded liability that could undermine the finances of the reform.

Sub-section 3.2 found that some regulations could have a negative effect on the system, especially if they did not evolve as the assets in the system grew over time. Portfolio limits set without regard to

limits of the domestic capital markets or with a view towards financing government deficits or pet programs (like housing) represent a major threat to long term performance. Restrictive policies with regard to foreign investment worsen the problem and reduce risk-adjusted returns for workers. Caps on charges are probably not the best approach since this is likely either to legitimize charges that are too high or increase market concentration when too low. Group and other types of discount, lower barriers to entry, increasing flexibility for product and service differentiation and a better educated consumer are alternatives that require much more thought and effort than caps and restrictions on transfers between funds. But the competition approach creates fewer distortions.

The same section observed that the payout stage is the least developed from a regulatory perspective. In several countries, workers are accumulating savings that in principle could be converted to annuities yet the technical foundation for regulating the products is not available. There is room for further improvement of these regulations in the countries where the market is already operating. For example, a few countries may be forcing too high a level of annuitization given public policy objectives.

Section 3.3 suggested that more analysis is needed to fully understand the tradeoffs between different approaches to collecting contributions. While there may be cost advantages to centralized collection, it is not clear whether a public monopoly is up to the task for some of the same reasons that asset management is entrusted to the private sector. As in disability certification, a public-private partnership appears possible and worth considering. In contrast, supervision must rest with a public authority with a certain degree of independence. While supervisory performance is less amenable to measurement, the advantages of specialized supervisors with regard to potential conflicts of interest appeared to outweigh disadvantages. Finally, there were no compelling reasons to maintain state-owned pension fund managers, with their explicit or implicit guarantees, competing with private participants.

There is evidence that many of these conclusions are shared by policymakers and that the current system design is evolving. The public forum about to start regarding the size and sustainability (read funding ratio) of the residual PAYG DB scheme in Costa Rica is one example. Incremental changes to investment limits are generally in the right direction, as in the case of recent efforts to

increase foreign investment in Costa Rica and Mexico. Specialized supervisions continue to be the preferred approach.

On the other hand, there have been several recent examples of decisions that move in the opposite direction. The new system in the Dominican Republic has a minimum pension guarantee that is tied to minimum wage, places a cap on commissions and uniquely, specifies the premium for disability and survivors insurance as well as benefit and eligibility conditions. Attempts to introduce the equivalent of social investment mandates have been partly successful in Costa Rica and El Salvador. Bolivia has fused the collective fund with the individual accounts without valuing shares in the capitalized firms at market prices violating this important principle of transparency.

None of these examples negates the strengths of the model itself. Funding is still more likely to lead to secure pensions through higher savings and growth. Privately managed and competitive fund management of defined contribution schemes protected by property rights is still more likely to allocate these savings effectively. Diversification of sources of retirement income between returns to labor and capital are still beneficial to workers. Nevertheless, in both design and implementation, these advantages may be undermined. Section 4 documents the experience thus far.

#### **4. COMPARING THE EARLY EXPERIENCE OF THE NEW PENSION SYSTEMS**

Focusing on system design can be valuable insofar as actual measures of performance mask underlying flaws that appear only when the system matures or suggest poor performance due to exogenous factors. This is especially true when there is a temptation to rush to a judgment regarding a contentious shift away from a model that has operated for a long time. But short experiences in pension reform, like a few years of weather observations, are unlikely to tell us what kind of pensions workers today will receive in thirty years when the first cohort to have participated their entire working lives retires.

The new pension systems, in our view, have not functioned long enough for any definitive conclusions to be drawn. This is true even for Chile, although there is growing evidence of success by certain measures based on the 22 annual observations available.

Nevertheless, during the long voyage to scheme maturation, it is useful to reflect every few steps on the direction in which things seem to be heading and make needed corrections along the way. The next section reflects on the experience through 2002 comprising 55 country-year observations.

#### **4.1. Coverage of the new schemes and exempted groups**

In principle, there is no reason that the new systems could not be applied to all workers (or at least all new entrants). For this reason, application of the new system is considered here an implementation rather than a design issue. Nevertheless, in no country, were the reformed systems described in Section 3 applied to all workers. To begin with, coverage was always partial before the reforms due to the prevalence of informal sector activity. The international relationship between coverage and income level has been documented elsewhere and a similar pattern holds in Latin America<sup>68</sup>.

Among the twelve reform countries, coverage defined as the proportion of the working age population covered by any pension scheme varies from about nine percent in Bolivia to about 47 percent in Uruguay as shown in the figure below<sup>69</sup>. The points are juxtaposed with bars representing the estimated covered wage bill to GDP ratio for the *funded* schemes in each country. The fact that the two indicators are weakly related across countries is mainly a function of three factors - transition arrangements, parallel schemes and different ceilings<sup>70</sup>. The first factor will disappear in the long run while the existence of parallel schemes requires major legal changes. Note that the Chilean covered wage bill ratio far surpasses the others due to the lack of parallel schemes and the fact that it has already gone through much of its transition.

Even among formal sector workers, not all were mandated to join the new pension system. To begin with, there were transition arrangements in many countries that allowed those already

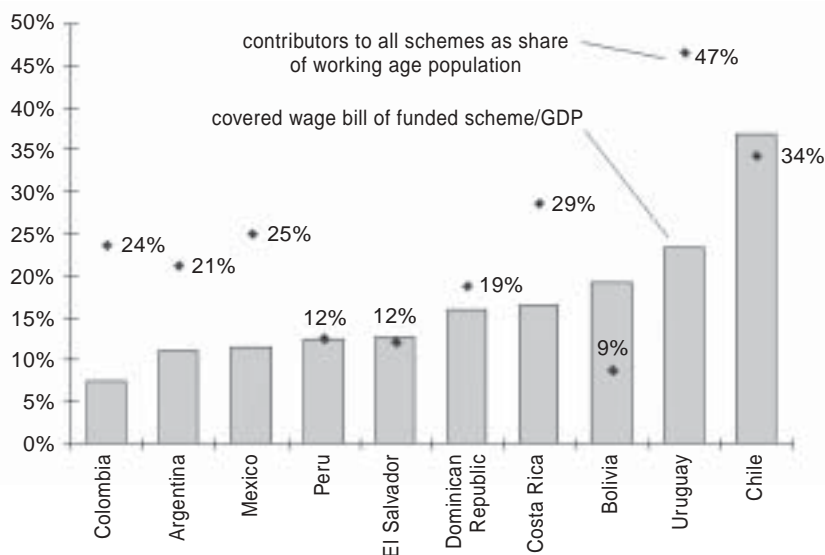
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<sup>68</sup> See Palacios and Pallares-Miralles (2000).

<sup>69</sup> These figures are lower than those usually presented using the economically active population (EAP). Demographic indicators avoid measurement and definitional problems but do not make it clear what proportion of the potential universe of contributors the schemes cover.

<sup>70</sup> Other factors include differential rates of underreporting of the wages of covered workers and the relative income level of covered workers to those exempted from the system in each country.

**Figure N° 9**  
**CONTRIBUTORS AS A SHARE OF THE WORKING AGE POPULATION**  
**AND COVERED WAGE BILL AS A SHARE OF GDP**



Source: own calculations based on country sources and FIAP survey.

contributing to the old system to continue to do so. This voluntary switching feature was applied to a greater or lesser extent in Argentina, Colombia, Chile the Dominican Republic, El Salvador, Peru and Uruguay with different rules and incentives<sup>71</sup>. As these schemes mature, most will see steady increases in the covered wage bill ratio even as coverage does not change significantly.

Another reason that the relationship between the covered wage bill and the coverage rate is not similar across countries is that several countries have indefinitely exempted certain formal sector workers. These exclusions take several forms - parallel defined benefit schemes, exemptions for civil servants and other groups and income-based exemptions. The types of exemptions by country are shown in Table 12<sup>72</sup>. In the case of Mexico, by exempting state and

<sup>71</sup> See Palacios and Whitehouse (1999).

<sup>72</sup> The self-employed are not required to contribute except in Argentina and below age 40 in Uruguay. In most countries, the military is also excluded and has its own scheme.

federal workers as well as the oil industry, as much as 15 percent of the formal labor force is not required to participate in the new system. This may change however, as the government is in the process submitting legislation to harmonize the exempt schemes and integrate federal workers into the new system.

Three countries –Argentina, Colombia and Peru– allow new labor market entrants to choose between a public, unfunded, defined-benefit scheme and the new system. A very small proportion of new workers chooses the public scheme in Argentina and Peru. This is partly due to the fact that workers not expressing a preference are automatically enrolled in the funded scheme. In Colombia, there are important asymmetries that encourage some workers, particularly those with low incomes, to remain in the public scheme. In addition, there is an option, unique among the reformed countries, for workers to reverse their decision to join the funded scheme every three years.

**Table N° 12**  
**EXCLUSIONS FROM THE NEW SYSTEM**

	<b>Parallel PAYG DB</b>	<b>Civil servant exemption</b>	<b>Other group exemptions</b>	<b>Income based exemptions</b>
Argentina	X		X	
Bolivia				
Colombia	X		X	
Chile				
Costa Rica			X	
Dominican Republic				
Ecuador				X
El Salvador				
Mexico		X	X	
Nicaragua				
Peru	X			
Uruguay				X

Source: surveys; legislation.

The existence of parallel pension models in these three countries is problematic for several reasons. First, it requires a certain amount of duplication of administration that increases the overall cost of the systems. Both Colombia and Peru must indefinitely maintain parallel collection and record-keeping infrastructures. This is especially inefficient when the number of workers choosing the public scheme is trivial as in the case of Peru or in Argentina where fewer than five percent of new labor market entrants opt for the pay-as-you-go scheme. Second, the continuation of the old pension model obviously undermines the objectives of the reform itself. The Colombian switchback option seems especially pernicious in this regard, since workers are essentially given a defined benefit guarantee that is equivalent to what they would have had if the defined contribution scheme had never been introduced.

The second column shows that civil servants have by and large been integrated into the new system. This is an impressive achievement. There are relatively few examples of successful integration of separate civil servants schemes worldwide, despite growing recognition of the merits of such reforms<sup>73</sup>. Most of the other pension systems in Latin America continue to have parallel schemes for civil servants. Among the reformers, only Mexico continues to exclude its federal workers.

The third column refers to the exclusion of certain quantitatively important categories of workers. Here, the record is mixed. In Mexico again, the estimated one million public employees at the state level plus several hundred thousand in PEMEX are excluded and in Argentina, a similar number of public employees in the provinces have their own, defined benefit schemes<sup>74</sup>. There are a large number of exemptions in Colombia<sup>75</sup> as well and a large number of teachers in Costa Rica have their own separate plan.

There is no obvious rationale for these exemptions. The public policy objectives of consumption smoothing and poverty reduction inherent in the pension system would not be different for these groups and any special characteristics of these workers could be

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<sup>73</sup> Examples include the United States which integrated its civil servants into the general pension system in 1984, Singapore in the 1990s and Hong Kong in 2000.

<sup>74</sup> It should be noted however, that many of the provincial government schemes have been closed.

<sup>75</sup> See Klejmans (2002).

dealt with through supplementary schemes<sup>76</sup>. On the other hand, there are clear costs to maintaining parallel systems. Like the parallel public schemes, the defined benefit schemes for specific groups are largely unfunded and therefore undermine this aspect of the reform. There is also the problem of portability that can impede labor market mobility.

The last column shows that two countries –Ecuador and Uruguay– apply income criteria for determining mandatory affiliation. The legislation in Ecuador emulated that of Uruguay and introduced a similar level of administrative complexity. This approach appears to be based on the idea that low-income workers are less able to cope with financial sector risks or to make informed choices in a funded system. However, these workers are also more likely to gain from the diversification of their sources of retirement income relative to high-income workers that tend to have other savings options.

Despite the exemptions and informal sector activity, the contributor base for the new systems is large and growing. Some have voiced concern regarding the ratio of contributors to affiliates, largely based on a misunderstanding of what the affiliates number represents<sup>77</sup>. Nevertheless, it is the case that at any given time, the snapshot of contributors understates the number of workers with a stake in the system in the form of an account balance. Early experience in the accumulation and payout periods is reviewed next.

## **4.2. Early experience in the accumulation period**

Despite these exclusions, more than 50 million workers in the nine countries where the new system has begun to operate will make contributions in 2003. A much larger number has contributed during the 55 country-years and now holds individual account balances. This section reviews the early experience of these workers during the accumulation period with regard to the development of the industry, growth of assets and portfolio composition, costs and charges and rates of return.

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<sup>76</sup> This is the case in Hong Kong for example, where additional, tenure-based contributions are made to the individual accounts of civil servants.

<sup>77</sup> While this ratio is important in the area of cost and charges (since there are costs to maintaining dormant accounts), its steady decline over time has been misinterpreted at times as evidence of a growing coverage problem. Valdes-Prieto (2002) explains why this is not a good metric for measuring changes in effective coverage over time.

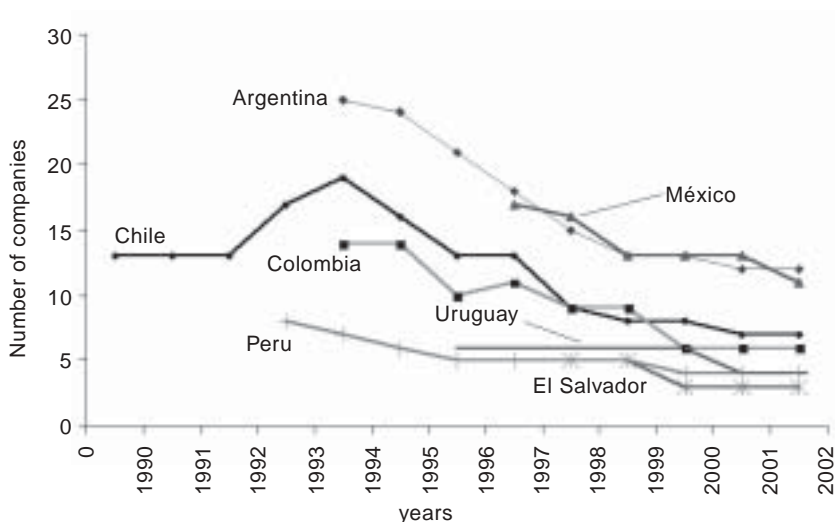


#### 4.2.1. The pension fund industry

To date, no pension fund manager has failed in any country. This is an important achievement and is undoubtedly a function of the conditions for market entry and rigorous standards imposed by supervisors. Many pension fund managers have disappeared through mergers however. Figure 10 shows the process of consolidation of the industry over time for seven countries. Bolivia is excluded due to its duopoly. The tendency, as in many new markets, is for competition by various entrants for market share followed by the sale of one firm to another or merger in order to reap the economies of scale that exist in this industry (see Section 4.2.2). This process is now unfolding in the new systems of Costa Rica and the Dominican Republic.

Not surprisingly, this has resulted in market concentration, a cause of concern for supervisors from at least two perspectives. Concentration could limit competition where possibilities for collusion exist. Also, in light of the projected accumulation of assets (see the next subsection), a relatively small number of firms would eventually manage a very large portion of long term savings

**Figure N° 10**  
**CONSOLIDATION OF PENSION FUND**  
**MARKET IN SEVEN COUNTRIES**



in the economy (see Table 17, below). This raises some, but not all of the concerns discussed in the context of monopoly public pension funds<sup>78</sup>. On the other hand, over time this is mitigated by the fact that insurance institutions also become important players.

Table 13 describes the situation in each country in 2002. At least half of the contributors belong to the top three firms in all countries and this ratio is above 80 percent in four of the countries. The size of assets relative to stock market capitalization and the percentage of outstanding debt held by pension funds are already high in some cases. The projected asset figures for 2015 suggest that the degree of market power will increase sharply. Finally, the average contributor per pension fund manager is more than 350,000. This highlights a special problem facing small countries with low coverage in maintaining a competitive market with multiple players and contestable markets.

**Table N° 13**  
**INDICATORS OF MARKET FOR PENSION**  
**MANAGERS AND ANNUITY PROVIDERS**

	Share of 3 largest managers (affiliates)%	Contributors per manager	Share of foreign ownership %	Operating costs per contributor (US\$)	Number of annuity providers
Argentina	60	267,250	66	100	20
Bolivia	100	380,500	76	19	1
Colombia	69	374,000	48	66	9
Chile	71	489,000	62	51	17
Costa Rica	80	77,750	0	22	1
Dominican Republic	n.a.	133,333	n.a.	n.a.	n.a.
El Salvador	100	330,940	77	116	n.a.
Mexico	55	1,149,100	72	51	14
Peru	85	291,975	72	69	5
Uruguay	92	154,165	20	50	2

Source: Solomon-Smith Barney (2002); FIAP survey; own calculations

<sup>78</sup> See Iglesias and Palacios (2000).

There are several requirements for participating in the market that make it more difficult to generate competition. The requirement for sole purpose providers, restrictions on ownership and minimum capital and reserves related to guarantees (see Appendix Table A.18) increase start up costs. The specialized nature of the activity has also led certain actors to seek transnational economies of scale as evidenced by the participation of certain foreign institutions (BBVA, Citibank etc.) in multiple markets.

#### 4.2.2. Pension fund supervision

The industry in each country is supervised either by specialized or integrated agencies as described earlier. Supervising a modern financial sector generally requires a high degree of capital in the form of well-trained staff and information technology. This in turn requires competitive pay scales and sufficient budget. In the case of the specialized entities, it is possible to compare their staff and budgets and to identify their source of financing as is done below in Table 14.

The table provides normalized indicators for six specialized supervisors. There is evidence of economies of scale, especially

**Table N° 14**  
**INDICATORS OF PRIVATE PENSION SUPERVISION, 2002**

	Staff per pension fund	Staff per 100,000 contributors	Budget per pension fund US\$	Budget per contributor US\$	Budget as % of wage bill	Financing source
Argentina	16	6.3	322,657	1.3	0.05%	Industry fees
Costa Rica	9	11.1	445,865	5.7	0.14%	Mixed <sup>2</sup>
Chile	20	4.1	711,135	1.5	0.03%	Government
Dominican Republic <sup>1</sup>	8	9.1	350,000	4.0	0.12%	Industry fees
El Salvador	35	22.2	1,016,440	6.5	0.08%	Mixed
México	19	1.7	1,675,078	1.5	0.02%	Mixed

Sources: own calculations based on SUPEN (2003); Palacios (2003);

<sup>1</sup> Based on target staff levels and budget and estimated contributor population by end-2003.

<sup>2</sup> Central Bank required to cover 80 percent with rest paid by industry fees.

with regard to the size of the budget relative to contributors and the covered wage bill. For example, Costa Rica, the Dominican Republic and El Salvador would have to levy much larger fees as a share of contributions or per contributor than would be the case in larger markets in order to finance the supervisor. On the other hand, the evidence is less clear with regard to spending per pension fund administrator. This partly reflects the immaturity of the markets in Costa Rica and the Dominican Republic where, further consolidation is likely to double the ratios of staff per fund and supervisory budget per fund shown here over the next few years. El Salvador appears to be the most expensive and has the highest ratio of staff to funds. The figures, actually understate this result since one of the three firms will be liquidated. However, it should also be noted that the role of the supervisor has been more extensive in El Salvador as it has been directly involved in assigning individual identification numbers and determining disability<sup>79</sup>.

Financing strategies range from complete budget support in Chile to industry fees in Argentina and the Dominican Republic (ignoring start up costs). El Salvador, Costa Rica and Mexico have mixed financing, although in Costa Rica the current financing is almost completely dependent on the Central Bank.

OECD (2003) discusses the tradeoffs between these different strategies. Complete dependency on budget could expose the supervisor to fiscal constraints that hamper its ability to keep up with state of the art technology and competitive salary scales. It also could be a source of political influence that jeopardizes its independence. On the other hand, reliance on industry fees could lead to regulatory “capture”. Another important argument, especially in countries with low coverage, is that general revenue financing of the supervision concerned with a small and relatively high-income part of the labor force is inequitable.

Most OECD countries with significant private pension funds finance their supervisions at least partly through fees. In light of the high degree of concern in most Latin American countries regarding political interference with the system and low coverage rates, the fee-based or mixed approach would tentatively appear to be the most advantageous.

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<sup>79</sup> See Acuña (2003).

### 4.2.3. Costs and charges

Table 15 compares commissions including and net of insurance costs for ten countries. The determinants and difficulty of comparing the insurance benefits has already been discussed. The net commissions range from 0.5 to 2.3 percent, but these figures are difficult to compare for several reasons. As noted above, charge structures vary across countries so that, for example, Mexican commissions which take various forms (asset based,

**Table N° 15**  
**COMMISSIONS AND INSURANCE PREMIA**  
**JUNE 2002**

Country	Total Commission	Disability & Death Insurance	Net Commission
Argentina	2.25	0.69	1.56
Bolivia <sup>1</sup>	2.21	1.71	0.50
Chile	2.43	0.67	1.76
Colombia	3.50	1.58	1.92
Costa Rica	n.a.	n.a.	n.a.
Dominican Republic	1.50	1.00	0.50
El Salvador	2.98	1.40	1.58
Mexico <sup>2</sup>	4.24	2.50	1.74
Peru	3.51	1.24	2.27
Uruguay <sup>3</sup>	2.73	0.81	1.92

Source: AIOS (2003). Solomon-Smith Barney (2002).

<sup>1</sup> Additionally, a commission is charged for the management of the investment portfolio, which limit is 0.02285% according to the limits established by the pension law.

<sup>2</sup> Similar commission over the flow. The contribution 2.5% of wage that corresponds to the insurance is directly addressed to the IMSS and is independent from the pension system.

<sup>3</sup> Additionally, a commission is charged for custody, which average in December 2002 was 0.00293% of the individual accounts' balance.

return based, flat fees etc.) and must be converted into an equivalent percentage of wage for comparisons. Other countries, such as the Dominican Republic and Costa Rica allow for charges based on returns and would also have to be converted into a percentage of average wage. The footnote for Bolivia is a reminder of a large cross-subsidy from the asset management fee on a collective fund that was part of the original concession.

A useful exercise in the analysis of charges is to simulate contribution histories and individual account balances with and without deducting charges. This provides some idea of the reduction in the net return on the individual account or reduction in the accumulated balance over the workers' lifetime. Whitehouse (2000) calculates charge ratios and reduction in yield for selected countries in Latin America. For the 'charge ratio' concept which measures the reduction in the accumulated balance relative to zero charges, he finds a range of between 13.5 and 26 percent, noting that these results are sensitive to various assumptions. These figures seem large compared to the more common expression of charges as a percentage of assets. The two charge structures do yield different paths of charges over time (see Figure 7 above) and are sensitive to different assumptions about earnings growth and rates of return. However, over the life-cycle with reasonable assumptions, a charge ratio of 15-20 percent is equivalent to around one percent of assets for workers that contribute one-tenth of earnings during their entire careers<sup>80</sup>.

While it is appropriate to estimate the impact of charges over the life cycle given the ultimate objectives of the system, these measures rely on the strong assumption that the current charge structure and observed levels will persist for the next several decades. The simulations therefore, lead to the question of what determines charges now and how might these factors change in the future. This requires an analysis of the determinants of the costs pension fund administrators and the extent to which those costs directly affect commissions and charges.

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<sup>80</sup> Intuitively, if charges are deducted from contributions each period and placed into a separate account earning the same rate of return as the individual account balance, the ratio of accumulated charges to what is in the individual account at the point of retirement is the same as the proportion of the contribution that was being deducted each period.

It is commonly assumed, for example, that there are economies of scale in the pension fund industry and there seems to be some empirical evidence supporting this proposition. Donoso (2002) for example, finds a clear relationship between the marginal cost per contributor and the number of contributors in the AFPs in Chile. The source of this is linked more to the fixed costs of record keeping and account maintenance rather than the asset management function which has not been a major component of cost so far<sup>81</sup>. The Chilean evidence is based on only seven observations, however.

In the Table 16, results of a simple multivariate regression using a sample of forty-nine pension fund managers from 8 countries for 2002 are reported. The costs per worker in US dollars are found to be significantly and negatively related to the number of contributors across this sample, suggesting economies of scale. The average income of the country is also taken into account in order to proxy different wage costs given the importance of salaries in the cost structure. Income level is significant and positively related to the cost per contributor. Figure 11 shows the implied cost per contributor against contributors for a country with the average income in the sample.

These factors do not explain all of the variation in costs. Not taken into account are other features of the system that could affect pension fund costs. These include the structure and charges for contribution collection and record keeping, fees paid to finance the supervision, taxes, transaction costs in local capital markets, reserve requirements and reporting rules among others. The maturity of the scheme may also affect costs if the recipients of scheduled withdrawals add to the administrative burden. Table 16 suggests that these factors may account for more than a third of the variation in costs across the region.

From the perspective of the individual, what matters is whether reductions in cost translate into reductions in charges. Not surprisingly, there is a strong correlation between costs and commissions in the sample<sup>82</sup>. However, there is also evidence of

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<sup>81</sup> Mastrangelo (1999) asserts that the fraction of operating costs related to asset management in Chile was less than one tenth. He also notes however, that this could change in the future, especially as foreign investment becomes more important.

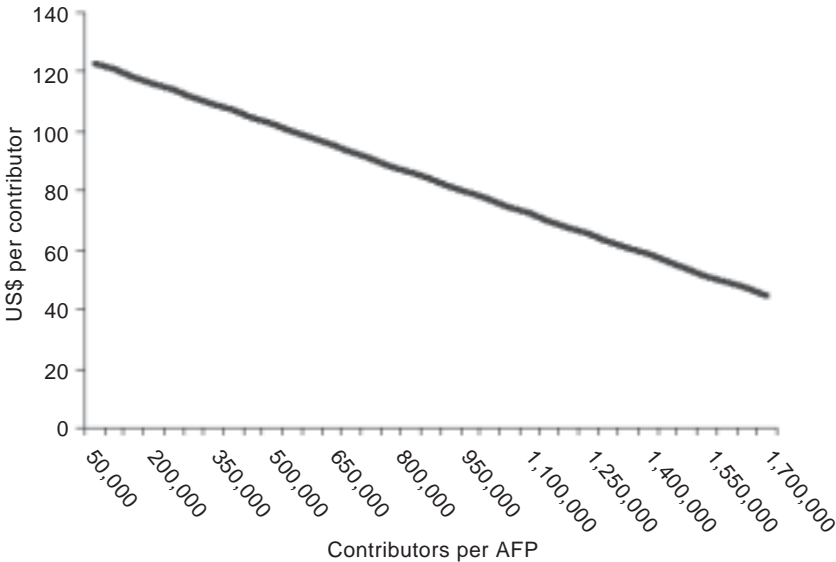
<sup>82</sup> The adjusted R-squared for a simple regression of costs on charges in dollars per contributor across a sample of 51 AFPs was 0.88.

**Table N° 16**  
**RELATIONSHIP BETWEEN COST PER CONTRIBUTOR IN**  
**US DOLLARS AND NUMBER OF CONTRIBUTORS FOR**  
**49 PENSION FUND MANAGERS**

Variable	Coefficient	t-statistic
Contributors	-0.0000462	-2.4
Income per capita (PPP US\$)	0.03272	7.5
Costa Rica dummy	-144	-4.4
Intercept	-136,3	-3.4
Adjusted R <sup>2</sup> = 0.59		
Observations = 49		

Source: own calculations.

**Figure N° 11**  
**ECONOMIES OF SCALE ACROSS**  
**A SAMPLE OF 51 PENSION FUND ADMINISTRATORS**



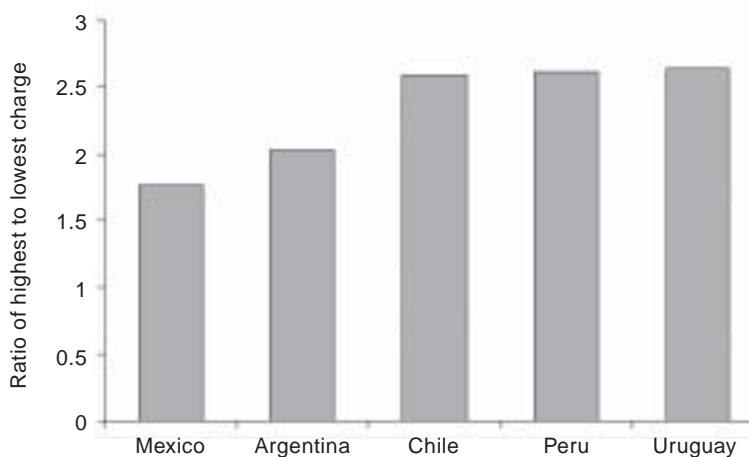
Source: Fitted line for the unweighted average income of the sample.



price dispersion within the same markets as shown below in Figure 12. Such large variations are not likely to be explained by solely by differences in product or quality of service. This reinforces similar findings for Chile presented by Donoso (2002) and highlights the apparent lack of price elasticity of demand that appears to characterize the industry<sup>83</sup>. Additional evidence supporting the lack of consumer attention to prices for these services have been highlighted by recent surveys in Chile, where workers have had the most experience. The survey shows that the vast majority of workers do not know how much they are charged by their AFP<sup>84</sup>.

One study on Argentina looked at the relationship between inflow and outflow of members in particular pension funds between 1994-97<sup>85</sup>. The authors found that there appeared to be no effect of charges on flows of new members into fund in either direction, but higher charges are associated with a larger loss of existing members. The relationship with marketing, sales and advertising expenditure showed the reverse pattern. Higher promotional spending seemed to

**Figure N° 12**  
**RATIO OF HIGHEST TO LOWEST**  
**CHARGE PER CONTRIBUTOR**



<sup>83</sup> See Donoso (2002) and Mastrangelo (1999) for a discussion.

<sup>84</sup> Ferreiro-Yazigi (2003).

<sup>85</sup> FIEL (1999).

**Table N° 17**  
**ACCUMULATION OF ASSETS IN**  
**THE FUNDED PENSION SYSTEM**

	Assets 2002 in millions US dollars	Assets 2015 in millions US dollars	Assets as share of GDP in 2002 %	Assets as share of GDP in 2015 %	Assets as % of stock market capitalization	Ownership % government debt
Argentina	11,923	57,023	10.4	30.9	14.5	6.5
Bolivia	2,749	5,884	33.5	43.5	171.8	37.0
Colombia	5,327	26,825	6.5	24.7	40.6	n.a.
Chile	35,832	95,388	56.2	89.7	65.8	64.6
Costa Rica	110	2,088	0.6	10.0	3.9	0.7
El Salvador	1,061	n.a.	7.7	n.a.	69.4	13.0
Mexico	317,437	247,887	5.2	26.0	37.1	14.7
Peru	4,083	26,813	7.2	28.1	39.8	3.0
Uruguay	804	1,942	7.7	13.3	962.5	7.6

Source: AIOS (2002); FIAP survey; Solomon-Smith Barney (2002). Soley (2002).

result in higher inflows, but had no significant effect on outflows. Considering these two effects together, the authors conclude that it is in the interest of the AFP to increase spending on advertising because the elasticity of net flows of members is approximately twice as large relative to marketing spending as it is to charges. The implication is that even if costs can be reduced through increased efficiency, these savings may not be passed along to the members of the scheme in the form of lower charges.

High charges in the new systems have been the subject of criticism. These criticisms are sometimes based on figures that include insurance commissions or take the form of misleading comparisons between the US Social Security system and the Chilean system<sup>86</sup>. The same critics point to the economies of scale to suggest that costs should be reduced through centralized (and naturally, public) management.

These arguments do not recognize important tradeoffs. The first involves potential reductions in the quality of service that is often

<sup>86</sup> See for example, Diamond (1996).

observed when there is little or no competition (at least in the form of market contestability). A key service provided by the pension fund managers is investing members' savings. It is straightforward to show that large percentage reductions in charges (say, 50%) are swamped by slightly higher long run returns on investments (say, 100 basis points per annum). The experience with investments by public pension monopolies suggests that loss in returns could easily offset any gains in lower costs and charges<sup>87</sup>.

There is also a tradeoff at the financial sector and even the macroeconomic level. Given the huge funds that will be accumulated in the coming decades and the high proportion of long term savings in the economy that these represent, a highly concentrated pension fund sector will lead to serious dilemmas on several fronts, including corporate governance. The logic of the economies of scale argument, (often reinforced by the idea that the profits that generate competition further reduce benefits) would lead to similar proposals for centralized models in other sectors such as banking or insurance.

A more sophisticated critique of charges in the new systems is concerned with competition policy and sees potential for translating greater efficiency into lower commissions when consumers are informed and markets are contestable<sup>88</sup>. The first condition does not seem to be prevalent and represents one of the major policy challenges of the post-reform period. The second condition can be affected by reducing barriers to entry. This in turn may entail a gradual easing of onerous regulations that inhibit new players from entering the market either due to high start up costs or difficulties in differentiating products.

#### *4.2.4. Asset accumulation and allocation*

Assets have accumulated rapidly in the systems that have operated for several years and are projected to grow strongly for all systems in the next decade as shown in Table 17. By 2015, pension fund assets will represent more than 10 percent of GDP in all countries and more than 20 percent of GDP in six of the countries including the largest economies, Argentina, Chile and Mexico. The projected

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<sup>87</sup> See Iglesias and Palacios (2000).

<sup>88</sup> For example, Valdes-Prieto (1999).

Chilean assets come to almost 90 percent of GDP given its maturity and relatively high coverage. Over the next thirty years, several countries should reach similar magnitudes. These are unprecedented developments in the accumulation of long term savings in the region and are likely to have important effects on capital markets and the economy as a whole.

The introduction of the ‘multifondos’ scheme in Chile merits a special mention, despite the short experience<sup>89</sup>. Since August 2002, approximately 1.4 million contributors have actively selected their portfolio allocation from among the options described in Section 3.2.1 above. More than two-thirds selected Fund C which effectively replicates the previous set of limits that were in place prior to this latest reform. About 15 percent of those selecting a fund opted for the more aggressive investment options offered by Funds A and B while just over 16 percent selected the lower risk-return combination found in Funds D and E. There has been a gradual tendency over time towards higher participation in Funds A and B. While the risk-return profiles of the five funds has behaved as expected, with Funds A and B yielding higher returns along with higher volatility, it should be noted that the two funds contain a much higher proportion of foreign securities than the others. For example, in July 2003, foreign assets in Fund A accounted for 45.6 percent of the total. This suggests that these more ‘aggressive’ funds offer a significant degree of diversification with respect to country-specific risk.

These early results appear to confirm both the heterogeneity of risk preferences among contributors as well as the ability of a large number of contributors to express these preferences in a multiple portfolio environment. Future research should provide important information on the characteristics of individuals choosing different portfolios.

Chile is the only country to date where the multiple portfolio environment has been tested. Currently, as shown in Table 18, individual accounts are highly concentrated in government bonds in most countries. Although this holds potential benefits in terms of extending the yield curve and adding liquidity to that particular market, it could also encourage governments to rely on what may

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<sup>89</sup> The figures cited here on multifunds come from the Association of AFPs (2003).

be almost a captive source of credit, blurring the distinction between the funded and pay-as-you-go financing models. Moreover, should the pattern continue in the long run, the lack of diversification implied would reduce risk-adjusted returns and, in extreme cases, exposes them to significant default risk.

As discussed in Section 3.2, diversification is hindered in some countries by current investment limits. Solis (1999) estimated for example, that limits in Mexico had reduced returns by as much as 75 basis points. Even if these are modified and investment options are increased, diversification will be gradual. More importantly, diversification will be constrained to the extent that foreign exposure remains limited. The supply of quality instruments is especially limited in some of the smaller countries that have reformed. This is evident in the high ratios of pension fund assets to stock market capitalization and in some cases, the high proportion of government debt already held by pension funds<sup>90</sup>. The situation will be attenuated in light of the projected growth of assets already discussed.

There is however, evidence that the development of domestic capital markets both quantitatively and qualitatively can be

**Table N° 18**  
**ACTUAL PORTFOLIO ALLOCATION BY TYPE OF ASSET, 2002**

	Government Debt %	Local Securities %	Foreign Securities %	Cash & Term Deposits	Fixed Income %	Variable Income %
Argentina	78	11	9	2	90	10
Bolivia	69	14	1	16	100	0
Chile	30	32	17	21	75	25
Colombia	49	34	5	12	93	7
Costa Rica	67	19	0	14	100	0
El Salvador	85	1	0	14	99	1
Mexico	83	15	0	2	100	0
Peru	15	53	7	25	71	29
Uruguay	64	6	0	30	100	0

Source: FIAP survey; Solomon-Smith Barney (2002).

<sup>90</sup> Tarzajan (2002) for example, cites the distortionary impact of excessive demand for short term fixed income instruments in Peru that reduce short term yields. This effect is largely due to the lack of alternative avenues for investment.

enhanced by the presence of the pension funds themselves. Catalan, Impavido and Musalem (2002) provide cross-country empirical evidence of this effect while Lefort and Walker (2002) find clear effects for Chile and mixed results for three other Latin American cases. Catalan (2002) suggests that the restrictions on foreign investment encourage pension funds to improve several key aspects of the domestic markets including shareholder protection and credit rating.

Parallel reforms can increase the supply of tradable securities, facilitating diversification of portfolios and creative technical solutions to pressures to invest in certain areas such as housing. Nevertheless, in some countries the limits of the domestic market will eventually be tested and the foreign investment limits should clearly be increased. Recent changes to increase foreign limits in Costa Rica, Chile and Mexico are steps in the right direction.

#### *4.2.5. Rates of return on individual accounts*

A key rationale behind the design of the new systems is that competing defined contribution schemes will seek to maximize returns subject to certain restrictions. The high real rates of return observed to date would suggest that this objective has been achieved. More importantly, the return-wage growth differential has been consistently positive and higher than what is typically assumed for the purposes of simulating replacement rates. Table 19 shows that this differential has ranged between 3.3 and 12.5 percentage points since inception over the sample with an unweighted average of close to ten percentage points. Returns were also higher than bank deposit rates during the same period with the exception of Argentina (see Appendix Table A.11). These results, while covering relatively short periods, are far superior to anything observed in public pension schemes around the world, including those that operated prior to the reforms in Latin America<sup>91</sup>.

Despite these results however, the earlier discussion of portfolio allocation suggests that these figures must be interpreted carefully<sup>92</sup>. To begin with, the concentration in government bonds

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<sup>91</sup> See Iglesias and Palacios (2000) and Mesa-Lago (1991).

<sup>92</sup> Another caveat is that returns are calculated differently across countries. See AIOS (1999) and Appendix Table 22.

**Table N° 19**  
**RATES OF RETURN ON INDIVIDUAL ACCOUNTS**

	Real rate of return since inception %	Standard deviation %	Real wage growth %	Return/ wage growth differential %	Real income per capita growth %	Return/ per capita growth differential %
Argentina	11.7	13.4	-0.8	12.5	-0.4	12.1
Bolivia	16.2	n.a.	8.8	7.6	0.4	15.8
Colombia	11.8	2.6	1.4	10.4	-0.3	12.1
Chile	10.5	9.3	1.8	8.7	4.5	6.0
El Salvador	11.3	3.6	-0.2	11.5	0.5	10.8
Mexico	10.6	n.a.	0.0	10.6	2.8	7.8
Peru	5.7	7.5	1.8	3.9	2.4	3.3
Uruguay	9.5	n.d.	3.6	5.9	-0.3	9.8

Sources: Surveys, Statistical Bulletin AIOS, Real Wage Table ILO.  
See Appendix Table A.10

may reduce volatility in a manner that may mask underlying risks. Another problem is the lack of clear values for certain assets. In El Salvador for example, a large proportion of the portfolio is invested in debt issued by a public housing institution without explicit government guarantees. These assets are not traded and pension funds are mandated to purchase them. Recent developments in Bolivia provide another example of a significant portion of pension fund assets that cannot be marked to market<sup>93</sup>.

Also, for many countries in the sample, income or wage growth during this period was unusually low or negative, a pattern not likely to continue in the long run (hopefully). Finally, it is important to note that the amount of dispersion of returns across different providers varies.

Nevertheless, the experience to date is consistent with the kind of positive return-wage differentials needed to produce reasonable

<sup>93</sup> In 2002, the Bolivian government forced the pension funds to merge individual account assets with the collective fund. In the process, shares of previously capitalized firms that have not been listed in a stock market became part of the individual account holdings. The value of these assets is unknown and what is reported are adjusted book values.

replacement rates. (Note that the benefit schedules in Section 3 assumed net returns of 1.5 percent higher than wage growth). They also put the question of commissions into perspective: the return-wage growth spread more than offsets any reasonable estimate of the cost advantage of a centralized, monopoly scheme over a decentralized competitive model. It also suggests that the funded scheme can provide a return higher than the sustainable rate of return in a pay-as-you-go system<sup>94</sup>.

In the long run however, the spread between government bond yields and the growth of tax revenues needed to pay off the debt plus interest implied by these figures (given high concentrations of the portfolios in government securities) is not sustainable in several countries (Peru and Chile are exceptions). A return-wage growth differential based on the rate of return on capital is more likely to resemble the 3-4 percentage point spread observed in Peru and Chile over the last decade or similar differentials observed for private pension funds with diversified portfolios in OECD countries. This depends crucially however, on how the regulation of investments evolves.

### **4.3. Early experience with the payout period**

With the exception of Chile, there is very little experience with the payout period. Table 20 shows the number of persons receiving some kind of old age benefit in seven of the countries. Bolivia, El Salvador and Uruguay have fewer than 500 cases. Only Argentina, Colombian and Chile have more than 10,000. Chile has by far the most cases with more than 400,000.

Annuities were practically non-existent before the pension reforms created demand. For example, in Chile, annuities represented less than 7% of the insurance market as late as 1988, seven years after the reform. In Argentina, annuities represented less than 0.2% of the market in 1989, five years before the reform, and in Peru, at the time of the reform in 1994, the market was limited to tax favored deferred annuity products (Seguros de Retiro). Today, the annuity market represents about one third of the insurance business in Chile and 14 and 11 percent of the market in Peru and Argentina, respectively at the end of 1998. In Colombia the market

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<sup>94</sup> Valdes-Prieto (2002a)



**Table N° 20**  
**RECENT EVOLUTION OF OLD AGE**  
**BENEFICIARIES FROM FUNDED SCHEMES**

	1997	1998	1999	2000	2001	2002
Argentina	1,980	7,299	11,636	21,344	29,318	31,580
Bolivia	0	0	0	0	0	384
Colombia	1,487	2,787	4,603	6,549	8,880	11,417
Chile	265,601	290,205	322,234	363,351	401,420	414,549
El Salvador	0	0	0	0	0	862
Peru	0	0	0	0	2,388	4,939
Uruguay	0	0	0	0	0	73

Sources: AIOS (2002); Acuña (2003) for El Salvador.

is still small and represented less than three percent of the insurance sector in 1998, but is growing rapidly. Except in Chile, most of the business is due to the annuities for beneficiaries of survivors and disability benefits.

Life insurance companies can participate in annuities markets in Colombia, Chile and Peru, but Argentina requires specialized providers that have separate balance sheets. As of 2002, twenty retirement insurance companies were selling pension annuities in Argentina. While this number of companies might suggest the existence of a competitive market, there is significant concentration in the top five providers.

Palacios and Rofman (2000) cite problems with the annuities market in several countries. In Argentina and Peru, for example, more than 80 percent of annuities were purchased from an insurance company related to the pension fund manager, suggesting that workers were being channeled towards their annuity providers. There was also evidence that consumers find it difficult to understand the various products.

It also appeared that brokers were sharing high commissions with the affiliate, so that those who cannot withdraw a free access portion still receive a lump sum at the time of retirement. This mechanism is likely to represent a present value loss to the pensioner, since it is difficult for them to know what their pension would have been under normal conditions. In addition, the broker pays income tax on the commissions received, so that a part of the amount paid winds up in government coffers. A case in Chile was cited where an individual who paid a life insurance company a single premium of 150,000 dollars, receiving in return a cash payment of 60,000 dollars and a life annuity pension of approximately 130 dollars. The 90,000 dollars he did not receive would have been enough to purchase a monthly pension of 600 dollars. This case resulted in Securities and Insurance Superintendency intervention, and life insurance companies are now expressly prohibited from making direct or indirect payments to pensioners.

Finally, it seems clear that there are tensions regarding the roles of the insurance and pension fund supervisions. In general, the standards for reporting and other areas are not as high for insurance companies as for pension fund providers. The problems found in annuity market supervision can be attributed, in part, to the application of a philosophy more suitable to supervise a voluntary and relatively small-scale insurance industry. Proposals to give full supervisory authority over annuities to the pension fund supervisory agencies have been promoted in Argentina and Chile as a way to harmonize supervision criteria in the accumulation and payout stages.

In several countries, the situation is even more difficult due to the limited nature of the domestic market and the dearth of good mortality data. While Costa Rica has just completed a detailed mortality analysis in order to establish the technical grounds for its payout stage, this remains to be done in the Dominican Republic, El Salvador and Nicaragua. The markets in all of the Central American countries, Bolivia and the Dominican Republic will continue to be small and it may be difficult to encourage competition between annuity providers in the medium term. Costa Rica is the extreme case with only one, state-owned monopoly representing the only potential provider at present<sup>95</sup>.

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<sup>95</sup> There are special provisions in Costa Rica that provide for lump sum payouts during the first ten years of the system, in other words, until 2011.

Long term contracts involving inflation-indexed annuities in each of these smaller countries will be especially difficult to generate given the state of the insurance sector and the lack of available assets to match these liabilities. This raises questions as to how to set reserve requirements. One interim solution will undoubtedly be to rely heavily on the scheduled withdrawal option. This has the important disadvantage of course of not providing longevity insurance. More creative solutions such as international bidding for cohorts of retirees may also be considered in these smaller countries. Whatever the solution, this aspect of the system will become more important as it matures and large numbers of potential annuitants reach retirement age.

#### **4.4. A brief note on the economic effects of systemic pension reform**

The systemic pension reforms described above may have important effects on savings, labor and capital markets and ultimately, economic growth. These effects are difficult to measure especially in the short time frame under consideration for all countries except Chile. Estimating this impact is beyond the scope of this paper. The purpose of this section is only to draw out some of the emerging lessons from the literature. The main lesson is that while the potential for positive growth impact through various channels does exist, the pension reform alone will not automatically achieve the desired positive results.

##### *4.4.1. Savings*

The most obvious example is the impact on savings. This depends crucially on two policies: The first is the extent to which the pension liabilities of the old system are reduced both through parametric reforms and through the valuation of accrued rights for those who join the new system. Even more important is how the transition from pay-as-you-go financing to funding is financed. Both are extremely difficult to measure<sup>96</sup>.

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<sup>96</sup> Another factor, the reaction of private savers to the reform is not a matter of public policy. This reaction depends on whether Ricardian equivalence applies and the extent to which participants in the scheme are credit constrained. In the case of Chile for example, Corbo and Schmidt-Hebbel (2003) assume an elasticity of -0.47 based on available empirical evidence.

Regarding the first point, the studies that are available generally conclude that the reforms, which almost always involve a partial default on existing pension promises, have reduced long term pension deficits and therefore, increased public savings<sup>97</sup>. The limitation of these studies however, comes when a counterfactual must be assumed. For example, would the parametric reforms to the old system (see Appendix Table A.19 have been passed in the absence of the systemic reform? Similarly, what is the counterfactual regarding indexation when this is discretionary in many countries? If pensions in the last decade have been eroded through under-indexation under high inflation, is it reasonable to assume that this practice would not have continued in the future?

Another area of great uncertainty involves the financing of the transition. In the short run, the so-called ‘transition deficit’ may result in the growth of public debt to the extent that fiscal policy is not adjusted to accommodate it. It is impossible to predict with any degree of certainty whether future governments will use debt or tax financing to cover the shortfall of pay-as-you-go revenues. In short, savings can be increased if a certain fiscal measures are taken in tandem. Tax financing is probably less likely when governments use the new pension funds as a captive source of credit. In other words, proper diversification rules for investment are linked to how the transition will eventually be financed.

While there is strong evidence of a positive savings effect in Chile, it is too early to know the outcome in the other countries<sup>98</sup>. What is clear however is that a potential gain does exist, that this gain is not possible without pension reform and that the potential impact is greater in a systemic reform. Whether the reform generates this effect depends on whether the pre-reform liability is reduced (based on the assumed counterfactual) as well as the eventual fiscal accommodation of the transition deficit. Only in the case of Chile has enough time passed to come to some reasonable conclusion on the latter question<sup>99</sup>.

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<sup>97</sup> See for example, Sales-Sarrapy and Solis-Soberron (1998) for Mexico, and Bertranou, Grushka and Shulthess for Argentina. Forteza (1999) comes to a more qualified conclusion in the case of Uruguay.

<sup>98</sup> For a review of the literature, see Iglesias (2001).

<sup>99</sup> For example, Valdes-Prieto (2002) contends that most of the transition costs in Chile were financed through increased public savings.

#### 4.4.2. Labor markets

Pension reforms can reduce labor market distortions by reducing the perceived tax element of the contribution or payroll tax and by removing subsidies to retire early. Reducing the tax component of the contribution may reduce the share of the labor force in the informal sector thereby increasing coverage of the system. It may also increase the overall employment level. Ultimately, these effects can result in higher growth rates<sup>100</sup>.

Coverage has risen in several countries after reform. In Chile, coverage measured as a share of employment or economically active population increased by ten percentage points between 1980 and 1999<sup>101</sup>. However, this was also a period of rapid economic growth, especially among formal sector employers. In order to assess the impact of the pension reform in isolation, it is necessary to account for other factors.

The fact that limited empirical evidence is available is due to several complications that arise in the analysis. First, the time period being considered is relatively short and economic conditions were unstable in many cases. Second, the reform does not affect the entire labor force. In fact, most of the reforms do not even encompass all formal sector workers. Using general coverage indicators as the dependent variable therefore, fails to isolate the portion of the workforce that is affected by the reform. Finally, and perhaps most importantly, the distortions imposed by the pension system are only one of many factors that encourage informal sector activity. The others, including mandatory severance, other social insurance taxes, income taxes, health and safety regulations to name a few, may play a greater role than pension taxes in driving small employers into the informal sector.

One of the more detailed empirical studies of the impact of systemic pension reform by Colina et. al. (2002) used household survey data to test for the presence of a structural change in coverage attributable to the introduction of the new, private pension scheme in Argentina. Their data set allowed them to differentiate between workers covered under the private, funded scheme and those covered under the public, pay-as-you-go scheme

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<sup>100</sup> Corsetti and Schmidt-Hebbel (1994).

and to control for a series of other variables. The study provided econometric evidence that the “costs associated with the labor code, collective bargaining and social security have a negative impact on coverage, especially for those workers with low productivity”. However, they could not identify any statistically significant impact on coverage due to the introduction of the new private pension scheme. They concluded that this reform appears to have had no impact or at most an impact much less important than other factors unrelated to the design of the pension system.

In contrast, Edwards and Cox-Edwards (2002) arrive at a more favorable estimate of the positive impact of the reform in the Chilean case. Based on simulations using Chilean parameters, they find that the reform may have led to an increase of informal sector wages and reduced overall unemployment. The result may reflect, among other things, the maturity and high coverage of the Chilean system and the greater extent to which the system was shifted from unfunded to funded than, for example, in Argentina.

While there is general agreement that incentives to participate in publicly-mandated pension schemes can be improved through better design, there is little empirical evidence to suggest that these are crucial determinants of formal sector participation. Many other factors ranging from rigidities in the labor market code, minimum wage rules, transaction costs associated with labor registration and even confidence in government institutions are likely to be just as important. Thus, applied in isolation, systemic pension reform is not likely to lead to a large increase in coverage. It is also clear that the impact of the reform on the overall labor market will be less, the smaller the share of the labor force covered in the funded scheme and the larger the residual pay-as-you-go, defined benefit scheme. No doubt these hypotheses can be tested in the future given the wide variation of design and coverage among the countries that have introduced reforms.

#### *4.4.3. Capital markets*

The potential impact on capital markets arises from the presence of a new class of institutional investors interested in long term savings instruments that match the structure of their liabilities or outflows. These investors bring a new dimension to the capital markets allowing for the creation of a yield curve and the

development of long-dated securities including those backed by mortgages. They can also increase liquidity, reducing spreads and improving price discovery in what are typically thin markets. Several studies have documented this effect empirically for the case of Chile<sup>102</sup>. Catalan (2002) also showed the active role of the new pension fund industry in improving regulations and standards in Argentina. On the other hand, investment limits and failure to properly regulate local capital markets can weaken this type of effect.

#### *4.4.4. Economic growth*

Increased savings, reduced labor market distortions and improvements in domestic capital markets can each have a positive impact on economic growth. As noted however, the potential benefits may not be reaped if other factors are at work. In this regard the major risk is that governments effectively reintroduce the pay-as-you-go model through the back door by mandating investments or financing deficits.

On the other hand, if workers' savings is channeled effectively and governments find a way to pay off a significant portion of the implicit pension debt that remains from the old model with higher taxes or reduced spending, a positive savings impact is highly probable. The link between savings rates and growth is clearly established<sup>103</sup>. Combined with improved efficiency in labor and capital markets, positive impact on economic growth is likely.

As was the case when the wave of reforms began, Chile once again provides an example for the more recent reformers. Parallel reforms, privatization, reduced tax burdens, disciplined fiscal policy and especially reforms to the capital markets coincided with the early phase of the pension reform<sup>104</sup>. A recent study by Corbo and Schmidt-Hebbel (2003) isolate these effects focusing on the growth impact of the pension reform. They find that the combined effect of labor, capital market and savings impacts on growth

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<sup>101</sup> See Jimenez and Cuadro (2003), Table 4.

<sup>102</sup> See Holzmann (1997) and Lefort and Walker (2001).

<sup>103</sup> Schmidt-Hebbel and Servén (1999).

<sup>104</sup> The system did, however, have to weather a banking crisis and recession in 1982. Were it not for the intervention of technocrats at the time and measures to quarantine the system against contagion of other parts of the financial sector, the outcome may have been very different.

through total factor productivity was on the order of 0.2-0.9 percent per year between 1981-2001.

The evidence suggests that pay-as-you-go schemes may reduce savings, can exacerbate labor market distortions and they clearly do not contribute to capital market development. Funded schemes in contrast have the potential to improve all three areas, albeit under the right conditions. The challenge for the countries that have reformed over the last decade is to harness this potential, as Chile appears to have done over the last two decades.

## **5. THE NEW PENSION SYSTEMS AT A CROSSROADS**

The new model of pension provision has, offered a viable alternative to the failing pay-as-you-go, public schemes that had become prevalent around the world over the last century. In its short history in Latin America, comprising 55 years of cumulative experience, millions of workers have opened accounts in specialized firms under strict supervision, acquired property rights and a greater degree of control over their retirement income. In general, they have enjoyed good rates of return, more flexibility in terms of benefits and better service in the new system.

Despite the positive early experience, the last section suggests that only Chile can be said to have consolidated its reform and to have taken advantage of the ancillary benefits to its economy. There is little doubt as to the credibility of the system, its robustness and its role in providing retirement income for Chilean workers. Regarding the impact on the economy, Chile's experience suggests that under the right conditions, the benefits of the new model can extend beyond affiliates of the system through various channels that increase economic growth.

In contrast, the reforms that have taken place over the last decade are not consolidated and in a few countries, proposals to reverse reforms are part of the public debate. A more insidious threat however, are the more frequent proposals that undermine the basic philosophy of the reform in an attempt to channel funds to a politically expedient purpose. This myopia has already gone some way towards compromising a key feature of the system, namely, transparency of individual account values in El Salvador and Bolivia. A somewhat different case is that of Argentina where it



was proven that property rights are never fully protected. While individual accounts may be better insulated, they are no more immune from expropriation than bank deposits<sup>105</sup>.

The evidence strongly supports the claims of an indirect impact on growth in the case of Chile, but there is very limited evidence beyond that country. This should not be surprising. The eleven post-Chilean reforms of the last decade include two that have not been implemented (Ecuador and Nicaragua) and one that has been operating for less than two months. The remaining eight have an average of only four years of experience.

With this in mind, it is useful to recall that the early years of the Chilean experience were characterized by a portfolio highly concentrated in government bonds and the system had to survive a major banking crisis and economic recession. The impact on capital markets in particular could only be felt once sufficient funds had accumulated and parallel reforms took place. Investment rules were gradually relaxed and improvements made culminating in the most recent, the introduction of more investment choice through the multifondos scheme. The Chilean experience illustrates the dynamic nature of these reforms and the need for stamina combined with a clear vision of the long run path towards success.

In this regard, the region is at a crossroads. In one direction lies consolidation and the realization of the potential indirect benefits of reform. This path involves the integration of all formal sector workers into the new system, the gradual liberalization of investment rules including international diversification, healthier competition, parallel reforms and the correction of design flaws in the original legislation. Examples include the plans in Mexico to allow investment abroad in 2004 and to bring federal government workers into the funded scheme and the renewed efforts this year in Costa Rica to address the sustainability of its still dominant pay-as-you-go scheme.

Unfortunately, there are also tendencies in the opposite direction. Precedents for government interference in investment policy now exist and it will require strong political will to reverse course at a time when assets are starting to reach double digits as a share of national income.

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<sup>105</sup> See Cortazar (2003).

Small countries with low incomes and coverage face extra challenges. The nature of the industry combined with the perceived need to impose onerous regulatory burdens during the initial years of operation leads to highly concentrated markets. Supervision costs are higher. Capital markets and insurance sectors are weak. A concerted effort involving multilateral and bilateral partners to tackle similar problems facing the countries with fewer than one million affiliates would be useful at this stage.

In all of the reformed countries, a vision of the future of the pension system is needed to guide what too often can seem like short term and reactive policy decisions. As stated in the introduction, pension policy is a long-term proposition. The success of the systemic reforms will be measured over decades. This becomes very clear when one notes that over eighty percent of affiliates in Latin America's private pension funds are under age 45 and that half of these are under age 30. This latter group will retire in about thirty years with accumulations in their individual accounts. The pensions that they can generate will largely be determined by the choices made in the areas highlighted above.

The most effective defenders of the basic principles and sound running of the new pension systems are well-informed affiliates and independent supervisors. Long run self-preservation also makes the pension fund industry a key ally, (albeit with selfish interests that lead to the need for effective supervision). Academia, non-governmental organizations and international organizations can all support efforts to improve the system. The stakeholders face a major challenge to ensure the viability and success of the new systems. Speaking on proposals to allow pension funds to invest abroad, a trade union leader in Mexico offered the following perspective<sup>106</sup>:

“El tema que causó mayor polémica en el Congreso de la Unión durante la discusión de las reformas fue la posibilidad de la inversión de capitales en el extranjero con el argumento de la falta de dinero para impulsar el crecimiento de la economía nacional y la necesidad de invertir dinero, de preferencia de las Afores, se decía, para ocupar esos capitales en caminos, electrificación, agua potable, etc., todo ello aderezado con el concepto de soberanía. Sin embargo, la postura del movimiento

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<sup>106</sup> Netzahualcóyotl de la Vega (2003).

obrero siempre fue en el sentido de que este tipo de inversión no está negado, la ley no lo impide; lo que exige es que el rendimiento sea el mejor. Si hay rendimientos y seguridad para invertir en ese tipo de operaciones en bien del desarrollo de la nación, no hay nada que lo impida. Pero si frente a ello existe la posibilidad de llevar a cabo una inversión en el extranjero y el mayor rendimiento y seguridad está allá, entonces no se va a sacrificar a los trabajadores. Afortunadamente, así lo aprobó la ley, con algunos candados saludables: con la vigilancia de la CONSAR y del Congreso de la Unión.

Pero lo que hay que destacar, y con eso termino, es que lo que el movimiento obrero no quiere es que al final de la vida laboral de un hombre éste llegue a una baja pensión y le demos una medalla por haber permitido que su dinero participara en el desarrollo del país. Pensamos que eso, siendo muy patriótico, muy soberano, muy nacionalista, no se vale puesto que sí están en juego los intereses de los propios trabajadores en la edad en que no pueden ya generar mayores riquezas y han participado durante toda su vida en un sistema en donde siempre ha habido el apetito de cómo encontrar algunas utilidades tangenciales. Lo que necesitamos es que el trabajador tenga el dinero suficiente para asegurarse una vida digna. Al fin y al cabo, ésa es la única finalidad de un sistema de ahorro para el retiro”.

This passage is an example of the kind of long term vision required from the stakeholders to ensure that the new model succeeds. More generally, this vision can be guided by the following questions:

What would the pension system have to look like when today’s young Latin American workers retire in 2033 in order that it be deemed successful?

What mileposts would have to be reached and which pitfalls would have to be avoided in order to assure success with a high probability?

A subjective and admittedly incomplete checklist of objectives for the year 2033 is presented below.

- The explicit objectives of the system - including overall benefit targets, acceptable dispersion of outcomes, balance of private DC and public DB, and funding targets are understood by policymakers and the public at large

- Minimum pension guarantees are linked to objective indices based on clear poverty objectives or replaced by social assistance schemes with greater coverage
- Unfunded liabilities due to residual public DB schemes or minimum pension guarantees are affordable
- All covered workers participate in the funded scheme
- Overall coverage of the labor force has increased in line with income per capita
- On average, accounts have earned a net return-wage differential of two percentage points or more over any 20 year sub-period
- The charge ratio for full career worker is below 15 percent
- Property rights have been infringed upon through expropriation
- There have been no failures of pension funds or large government bailouts
- Significant diversification of country-specific risks
- Significant diversification into private domestic securities
- Most workers have a reasonable understanding of their provider and portfolio choices and are able to compare prices
- Supervisors are institutionally and financially independent and are not beholden to the executive branch of government
- The sum of the implicit pension debt and the explicit conventional debt is less than what was projected prior to the reform
- A majority of the voting population would reject proposals to revert back to the old pension model

These goals are attainable. If they are achieved, the new model of pension provision pioneered in Latin America is likely to succeed. In the coming decades, it will be adopted by a growing number of countries around the world where similar challenges will face reformers. Although the outcome is not certain, and cases of poor implementation will emerge, there is a good chance that the new model may eventually succeed where the old one failed.

## APPENDIX

**Table A N° 1**  
**PARAMETERS USED FOR SIMULATIONS**  
**IN SECTION 3 (2003)**

	Argentina	Chile	Colombia	Costa Rica
<b>Pension age</b>				
Men/women	65/60	65/60	62/60	62/60
<b>First tier</b>				
Minimum pension	—	20-25%	50%	20%
Basic pension (% average earnings)	28%+1%/yr >30yrs	—	—	—
Qualifying years	30	20	25	20
<b>Second tier</b>				
Type	—	—	—	DB
Accrual rate (% earnings)	—	—	—	60% + 1%/yr >20yrs
<b>Third tier</b>				
Contribution (% earnings)	6%	10+2.3%	12%	4.25%
<b>Ceiling</b> (% average earnings)	580%	311%	1000%	None
<b>Social security contributions</b>				
Employer	22-31%	5.06-11.86%	23.5-31.8%	27%
Employee	17%	19.3%	8.125%	11.75%
Pensioner (% earnings/income)	3%	—	—	—
<b>Personal income tax</b>				
Allowance	41%	18%	260%	26%
Top rate threshold (% average earnings)	1210%	213%	1040%	39%
Number of rates	6	5	4	2
Rates (range) (% income)	9-35%	5-35%	10-35%	10-15%

Table A N° 1 continued

Dominican Republic	El Salvador	Mexico	Peru	Uruguay	
60	60/55	65/60	65	60	<b>Pension age</b> Men/women
40%	32%	23%	25%	20%	<b>First tier</b> Minimum pension
—	—	—	—	—	Basic pension (% average earnings)
30	25	25	20	35	Qualifying years
—	—	—	—	DB	<b>Second tier</b> Type
—	—	—	—	50%+0.5%/yr >35yrs	Accrual rate (% earnings)
8%	10%+3%	6.5% + 5.5% of min. wage	8+3.51%	7.5-15%	<b>Third tier</b> Contribution (% earnings)
1050%	164%	642%	None	570%	<b>Ceiling</b> (% average earnings)
14.12%	14.25%	21-30.65%	13.5%	22.5%	<b>Social security contributions</b> Employer
5.88%	9.25%	4.875%	10-21.2%	18%	Employee
—	7.8%	—	4%	—	Pensioner (% earnings/income)
185%	102%	Credit system	17%	51%	<b>Personal income tax</b> Allowance
463%	614%	—	203%	850%	Top rate threshold (% average earnings)
3	3	7	5	6	Number of rates
15-25%	10-30%	3-35%	10-35%	2-11%	Rates (range) (% income)

Source: Whitehouse (2003).

**Table A N° 2**  
**PORTFOLIO LIMITS BY INSTRUMENT, 2002**

	<b>Government Debt</b>	<b>Local Securities</b>	<b>Foreign Securities</b>	<b>Cash &amp; Term Deposits</b>	<b>Fixed Income</b>	<b>Variable Income</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
Argentina	80	100	20	30	100	60
Bolivia	100	100	50	40	100	75
Chile	50	100	20	50	85	40
Colombia	80	100	10	20	100	38
Costa Rica	90	40	25	40	100	20
Dominican Republic	10	100	0	60	100	30
El Salvador	100	100	0	40	100	5
Mexico	100	100	20	10	100	0
Nicaragua	50	100	30	50	100	10
Peru	40	100	10	30	100	35
Uruguay	90	70	0	30	100	0

Sources: Salomon Smith Barney (2002)  
Limits for Chile assuming Portfolio C

**Table A N° 3**  
**PORTFOLIO LIMITS BY TYPE OF ASSET, 2002**

Country	Government			Private							Foreign		
	Central Government %	Local Government %	Others %	Financial institutions			Companies		Others		Bonds %	Equity %	Mutual Funds %
				Cash and term deposits %	Bonds %	Mortgage backed Securities %	Bonds %	Equity %	Mutual Funds %	Derivatives %			
Argentina	50.0	30.0		30.0		40.0	60.0	20.0	20.0	2.0	10.0		
Bolivia	100.0	10.0			50.0	50.0	45.0	40.0	10.0		50.0		
Chile	50.0			50.0		50.0	70.0	40.0	25.0	25.0	10.0		
Colombia	50.0		20.0	2.0	40.0	40.0	30.0	30.0	5.0		10.0		
Costa Rica	70.0				5.0	70.0	30.0			20.0			
Dominican Republic			10.0	60.0		50.0	70.0	30.0					
El Salvador	80.0		15.0	40.0		15.0	50.0	5.0					
Mexico													20.0
Nicaragua	50.0			50.0		30.0	50.0	10.0					30.0
Peru	60.0			30.0	25.0	40.0	40.0	35.0	15.0	5.0	7.5		
Uruguay	60.0			30.0	30.0	20.0		25.0					0.0



**Table A N° 4**  
**PORTFOLIO LIMITS IN MEXICO, 2002**

<b>Rating</b>	<b>% of Investment portfolio</b>	<b>Issuer limit</b>
AAA	100%	5%
AA	35%	3%
A	5%	1%

**Table A N° 5**  
**INVESTMENT LIMITS BY ISSUER, 2002**

	<b>Issuer limits</b>								
	<b>Local Gov %</b>	<b>Term deposits %</b>	<b>FI Bonds %</b>	<b>MBS %</b>	<b>Bonds %</b>	<b>Equity %</b>	<b>Mutual funds %</b>	<b>FOR Bonds %</b>	<b>FOR Equity %</b>
Argentina	4.0	50.0		5.0	5.0	2.5		2.5	2.5
Bolivia			10.0		10.0	10.0			
Colombia					7.0	5.0			
Costa Rica					10.0				
Dominican Republic						10.0	5.0		
El Salvador					6.0	5.0			
Mexico									
Nicaragua					10.0	10.0	5.0		
Peru						7.5	3.0		
Uruguay					3.0	3.0			

**Table A N° 6**  
**CHOICE OF PROVIDER, PORTFOLIO AND**  
**BENEFIT MODALITY**

	<b>Rules for changing provider</b>	<b>Number of portfolio options</b>	<b>Choice of benefit modality</b>
Argentina	Every 4 months	One	PW, DA, LA, VA
Bolivia	After 12 contributions	One	LA, VA
Colombia	N/A.	One	PW, DA, LA
Chile	Every 2.5 months	Five	PW, DA, LA
Costa Rica	After 12 months	One	PW, LA
Dominican Republic	Once a year	One	PW, LA
El Salvador	Every six months	One	PW, DA, LA
Mexico	Once a year	One <sup>1</sup>	PW, LA
Nicaragua	After 12 contributions	One <sup>1</sup>	PW, LA, PW with LA
Peru	After 6 contributions	One	PW, DA, LA
Uruguay	After 6 contributions	One	LA

Source: AIOS.

<sup>1</sup> Additional portfolio choices foreseen in regulations.

<sup>2</sup> PW = programmed withdrawal; DA = deferred annuity/temporary payment;

LA = life annuity ; VA = variable annuity

<sup>3</sup> Variable annuity expected to be introduced in Chile in 2004.

**Table A N° 7**  
**AGENCIES RESPONSIBLE FOR DISABILITY DETERMINATION**

Country	Agency
Argentina	3 agencies: Medical Commission, Social Security, National Court Medical Board financed by the insurance companies
Bolivia	2 agencies: Medical Commission, Central MC
Chile	2 agencies: Regional Medical Boards, National Board
Colombia	1 agency: Qualifying Commission (Caja Costarricense de Seguridad Social)
Costa Rica	2 agencies: Regional Medical Boards, National Board
Dominican Republic	2 agency: regional medical boards, national board
El Salvador	1 agency under the authority of the Supervisor of Private Pensions
Mexico	1 agency: Instituto Mexicano de Seguridad Social (IMSS)
Perú	2 agencies: AFP Committee, Supervision

Source: Gruschka (2003).

**Table A N° 8**  
**DISABILITY BENEFIT LEVELS IN SELECTED  
LATIN AMERICAN COUNTRIES**

Country	Benefit in terms of average income	Reference period used to calculate average income
Argentina	Regular: 70%. Reduced: 50%	5 years
Bolivia	70% (plus 10% to individual account for old age)	last salary
Chile	Employees: total: 70%, partial: 50% Self-employed: total: 50%, partial: 35%	10 years (adjusted for inflation)
Colombia	Related to disability proportion	n.a.
Costa Rica	60% plus 0.0835% for each monthly contribution over 240	60 months (best 4 years adjusted for inflation and wage growth)
Dominican Republic	Total: 60%, Partial: 30%	3 years (adjusted for inflation)
El Salvador	Total: 70%. Partial: 50%	10 years
Mexico	35% (including family subsidies)	500 weeks
Peru	Total: 70%, Partial: 50%	3 years (adjusted for inflation)
Uruguay	Total: 65%, Partial: 65% (maximum of 3 years)	10 years

Source: Gruschka (2003).

**Table A N° 9**  
**CONTRIBUTION REQUIREMENTS FOR DISABILITY BENEFITS**  
**IN SELECTED LATIN AMERICAN COUNTRIES**

Country	Requirements
Argentina	30 months in the last 3 years, or reduced benefit with 18 months
Bolivia	60 contributions, at least one in the last year and or 18 in the last 3 years
Chile	Employees: one contribution in the last year and 6 months in the previous year. Self-employed: previous month
Colombia	26 weeks in the year previous to last contribution
Costa Rica	36 monthly contributions, the first one before age 55
Dominican Republic	unspecified (assumed to be immediate)
El Salvador	36 monthly contributions, women aged below 55 and men below 60
Mexico	250 weeks
Peru	3 consecutive in the last 4, 4 non-consecutive in the last 6 months, excluding illness pre-existent at the time of affiliation
Uruguay	2 years, including 6 months immediately previous to disability

**Table A N° 10**  
**ANNUAL GROSS REAL RATE OF RETURN FOR INDIVIDUAL ACCOUNTS**

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Weighted Average %	Std. Dev. %
US	16.2	3.2	8.7	-2.0	22.7	10.7	18.8	20.4	12.9	-6.8			10.1	9.8
Japan	5.8	0.5	10.3	-1.3	12.4	5.3	3.6	-1.6	21.1	-4.5			4.9	7.7
Australia	19.1	3.8	23.0	-5.9	12.6	7.0	15.4	13.4	7.1	1.1			9.4	8.7
Switzerland	3.5	5.4	13.5	-0.5	8.2	9.8	16.1	9.4	8.3	1.5			7.4	5.2
UK	13.2	14.9	23.6	-5.9	16.4	7.9	13.2	12.1	18.6	-5.6			10.4	9.7
Sweden	7.5	8.9	26.2	-3.8	14.4	22.4	18.0	16.2	27.7	1.7			13.6	10.4
Argentina					17.8	19.8	14.4	-2.1	18.1	3.9	-10.4		8.2	11.8
Bolivia							1.3	8.8	13.2	11.1	16.0	15.8	10.9	5.5
Colombia					14.4	15.8	11.7	9.5	11.7	7.8	10.5	9.7	11.4	2.6
Chile	29.7	3.0	16.2	18.2	-2.5	3.5	4.7	-1.1	16.3	4.4	6.7	3.0	8.1	9.5
El Salvador									12.9	12.6	9.2	5.2	9.9	3.6
Mexico								6.5	13.7	7.7	17.9	11.0	11.3	4.6
Peru				8.6	5.6	5.8	11.1	-4.8	18.7	-3.3	10.9	12.9	7.0	7.5
Uruguay							4.9	7.3	11.3	10.1	19.3	24.8	15.4	7.6

Sources: Surveys, Phillips & Drew (2002); AIOS (2002).

**Table A N° 11**  
**ANNUAL REAL RATE OF RETURN OF INDIVIDUAL**  
**ACCOUNTS SINCE INCEPTION**

	Real rates of pension returns %	Standard deviation %	Real rates of deposit returns %	Standard deviation %	Difference pension minus bank deposit %
Argentina	8.2	11.8	9.2	3.8	-1.0
Bolivia	10.9	5.5	6.5	2.7	4.4
Colombia	11.4	2.6	5.4	2.0	6.0
Chile	8.1	9.5	4.5	2.0	3.6
Mexico	11.3	4.6	-3.1	2.0	14.4
Peru	7.0	7.5	6.0	3.2	1.0
Uruguay	15.4	7.6	6.5	5.4	8.9

Sources: AIOS (2002); survey: IMF IFS Statistics.

**Table A N° 12**  
**EVOLUTION OF PENSION FUND**  
**ASSETS AS A SHARE OF GDP**

	1997 %	1998 %	1999 %	2000 %	2001 %	2002 %
Argentina	2.9	3.4	5.4	7.0	7.9	
Bolivia	2.1	4.1	7.4	10.0	12.4	15.5
Colombia	1.3	1.9	3.0	4.2	5.3	7.3
Chile	46.0	39.6	51.2	53.9	52.7	51.9
Costa Rica				2.2	3.3	4.2
El Salvador		0.5	2.2	4.3	5.6	7.4
Mexico			2.4	3.0	4.2	5.2
Peru	2.6	3.3	4.9	5.2	6.6	7.1
Uruguay	0.8	1.5	2.6	3.9	6.0	

Sources: Salomon-Smith Barney (2002); survey responses;

**Table A N° 13**  
**EVOLUTION OF NUMBER OF CONTRIBUTORS**  
(IN THOUSANDS)

	1997	1998	1999	2000	2001	2002
Argentina	3,074	3,459	3,483	3,280	2,562	3,027
Bolivia	n.a.	n.a.	n.a.	n.a.	438	420
Colombia	1,296	1,517	1,776	1,916	2,111	2,244
Chile	3,296	3,149	3,262	3,196	3,450	3,423
Costa Rica						702
Dominican Republic						
El Salvador	n.a.	570	736	848	920	993
Mexico	10,961	11,551	12,331	12,982	12,587	12,640
Peru	728	903	1,016	1,019	1,125	1,168
Uruguay	287	290	315	312	326	271
Total	19,735	21,535	23,075	23,755	23,809	24,884

Sources: Salomon-Smith Barney (2002); survey; SUPEN.

**Tabla A N° 14**  
**EVOLUTION OF COMMISSIONS AS SHARE OF ASSETS**

	1997	1998	1999	2000	2001	2002
	%	%	%	%	%	%
Argentina			6.7	4.6	3.0	4.2
Bolivia					1.5	1.6
Colombia	5.8	4.8	3.8	3.0	2.6	
Chile	1.8	2.0	1.5	1.3	1.3	1.2
Costa Rica						2.1
El Salvador			29.8	15.6	10.0	9.5
Mexico			2.7	0.9	3.2	2.5
Peru	6.4	5.9	4.2	5.0	4.0	3.8
Uruguay			3.8	2.3	1.9	2.6

Sources: AIOS, Salomon Smith Barney (2002)

**Table A N° 15**  
**EVOLUTION OF COMMISSIONS PER CONTRIBUTOR IN US DOLLARS**

	1997	1998	1999	2000	2001	2002
Argentina			292	275	247	144
Bolivia					23	24
Colombia	54	57	52	52	54	n.a.
Chile	182	175	152	148	125	120
Costa Rica						40
El Salvador			110	105	85	99
Mexico			38	19	103	90
Peru	132	113	99	136	130	130
Uruguay			64	56	59	78

Sources: AIOS (various years).

**Table A N° 16**  
**SALES FORCE PER 1,000 CONTRIBUTORS**

	1995	1996	1997	1998	1999	2000	2001	2002
Argentina	4.7	6.6	6.4	4.3	3.4	3.6	4.4	3.0
Colombia			3.7	3.5	3.0	2.9	2.4	1.8
Chile	5.2	5.7	5.3	2.0	1.2	0.9	0.8	0.8
El Salvador				2.2	1.1	1.0	0.6	0.4
Mexico			5.8	1.3	0.9	1.0	0.9	1.0
Peru		6.0	4.2	3.3	1.7	1.0	0.8	0.7
Uruguay								0.3

Source: AIOS (various).



**Table A N° 17**  
**NUMBER OF TRANSFERS PER 1,000 CONTRIBUTORS**

	1995	1996	1997	1998	1999	2000	2001	2002
Argentina	145	246	318	120	95	122	161	109
Bolivia								4
Colombia			108	54	65	102	73	40
Chile	449	503	479	221	150	80	68	30
El Salvador					40	156	89	33
Mexico				0	4	7	8	10
Peru			119	44	28	5	6	4

**Table A N° 18**  
**MINIMUM CAPITAL AND RESERVE REQUIREMENTS**

	Minimum capital US\$	Reserves for guarantee % of fund
Argentina	3,000,000 <sup>1</sup>	2%
Bolivia	1,500,000	n.a.
Colombia	2,302,000	1%
Chile	117,500 <sup>2</sup>	1%
Costa Rica	827,000	None
Dominican Republic	471,900	
El Salvador	59,150	Up to 3% <sup>1</sup>
Mexico	2,300,000 <sup>2</sup>	n.a.
Peru	n.a.	n.a.
Uruguay	475,200 <sup>1</sup>	2%

Source: Devesa-Carpio and Vidal Melia (2002).

<sup>1</sup> Currently set at 1.5%.

<sup>2</sup> In addition, \$366,000 for each SIEFORE plus a special reserve of the larger of \$2.3 million or 1.65 times the value at risk (VAR).

**Table A N° 19**  
**PARAMETRIC REFORMS IN LATIN AMERICAN COUNTRIES**

	Retirement (Men/women)		Contribution rate %		Minimum years required	
	Before reform	After reform	Before reform	After reform	Before reform	After reform
Argentina	55/60	60/65	27	27	20	30
Colombia	55/60	57/62	8	13.5-14.5	500 weeks	1000 weeks
Costa Rica	62/60	62/60	7.25	11.5	20 weeks	20 years
Dominican Republic	60/60	60/60	6.25 <sup>2</sup>	10	800 weeks	30 years
El Salvador	55/60	55/60	8	13	15	25
Mexico	65/65	65/65	15.5	16.5-21	500 weeks	25 years
Nicaragua	60/60	65/60	5.25	10.5	750 weeks	25 years
Peru	55/60	65/65	9	13.3	15/13	20 <sup>1</sup>
Uruguay	55/60	60/60	27.5	27.5		

Source: Adapted from Jiménez and Cuadros (2003) and other official sources;

<sup>1</sup> Public servants.

<sup>2</sup> Based on prorated contribution for health and pensions combined.

**Table A N° 20**  
**DETAILED PORTFOLIO LIMITS FOR**  
**‘MULTIFUNDS’ SCHEME IN CHILE**

Instrument	Found A	Found B	Found C	Found D	Found E
Government	40	40	50	70	80
Time deposits, bonds etc.	40	40	50	70	80
Letters of credit	40	40	50	60	70
Corporate bonds (all types)	30	30	40	50	60
Shares	60	50	30	15	not eligible
Investment/mutual funds	40	30	20	10	not eligible
Commercial paper	10	10	10	20	30
Foreign securities (overall)			20		
Others authorized by Central Bank	1-5	1-5	1-5	1-5	1-5
Hedging operations	allowed				
Foreign exchange unhedged	37	22	18	13	9
Loans	15	10	5	5	5

Source: Superintendency of Pension Fund Administrators.

Adapted from Jimenez and Cuadros (2003).

**Table A N° 21**  
**RELATIONSHIP BETWEEN MINIMUM WAGE,**  
**URBAN POVERTY LINE AND INCOME PER CAPITA**  
**FOR SELECTED COUNTRIES, 1999**

	(1) Extreme urban poverty line	(1/3) %	(2) Minimum wage \$US dollars, annualized 1999	(2)/(3)	(3) Income per capita
Argentina	859	12	2,400	32	7,435
Bolivia	336	35	668	70	960
Chile	491	10	1,957	38	5,129
Colombia	448	20	1,669	74	2,268
Costa Rica	450	12	2,609	72	3,625
Dominican Republic	505	20	1,884	76	2,479
Ecuador	232	16	630	45	1,404
El Salvador	402	23	1,465	84	1,737
Mexico	682	15	1,027	22	4,583
Nicaragua	316	67	n.a.	n.a.	471
Uruguay	677	11	1,063	18	5,930
Promedio	491	22	1,537	53	3,275

Source: Adapted from Jimenez and Cuadro (2003) and Palacios (2004). Note: annualized figures ignore 13th month payments.

**Table A N° 22**  
**METHODOLOGY FOR CALCULATION OF**  
**REPORTED RATES OF RETURN**

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Argentina	Both calculations are a nominal return calculation and is a result of the average individual share variation during the period of return. The average individual share value is based on the daily closing values and the number of workdays in the month. The Nominal Monthly Return takes the current and prior months individual share values, while the Yearly Return will take the last month and first monthly in the latest 12-month period being considered.
Bolivia	The individual shares are not calculated on an average basis but just the last and first share value of the period in reference. Once that value is calculated it is later annualized to obtain the yearly figure. The Bolivian system does calculate nominal and real returns; the real return calculation deflects the nominal return by the CPI numbers.
Chile	The monthly nominal and real return rates are calculated in function of the average individual share values during the period in consideration. Nominal calculation takes into consideration average values of individual shares from the current and prior month. The real return calculation takes into consideration the CPI numbers.
Colombia	Here the daily annualized and average lagging 36 monthly returns are calculated. The daily return is calculated as a proportion of the initial value that is later annualized, so the reference point is the initial value of the fund at the beginning of operations. The 36 month return is simple the IRR calculation of the cash flow of that period.
Costa Rica	Here the average individual share variation is based on the close price of every day of the month (weekends and holidays included). Since few instruments are on a 365 basis, the average must be based on 30 calendar days. Both nominal and real return calculations are computed.
El Salvador	The nominal monthly return is calculated in function of the average individual share value between the months in concern. The average share is calculated on basis of the number of calendar days in the month. Both the nominal monthly and current 12 month period return are calculated.
Mexico	Here the variation of the shares in the pension fund is used as the basis. Each share value is obtained by finding the equity value of each share ((Assets-Liabilities)/# shares). Nominal Daily, Nominal Accumulated and Real Returns are kept on record. Real return take into consideration the inflation rate.
Peru	The return calculations are obtained by the monthly variation of the individual shares value of the period in consideration. The nominal return is first calculated then the CPI numbers are used to determine the real returns. The average monthly share value is obtained using all the calendar days with weekends and holidays are valued using the closing monthly value. Real return calculations are computed for 12,24,36 and 48 month periods.
Uruguay	The return calculations are obtained with the variation of the average share value in the period under consideration. The basis of the average is the number of workdays in the month. The nominal annual return is calculated by using the current month and 12 month prior return period. The real return is calculated by factoring in the salary growth in the period in consideration.

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# THE VIEWS OF THE INDUSTRY

CARLOS PEGUET<sup>1</sup>

This document will not analyse “the” view of the industry but rather “a” view of the industry, because in an activity as young as this one, there is still plenty of room for enrichment, as far as different approaches and positions are concerned. It will consequently explain one of those in existence, particularly with an acquired experience of almost ten years, as is the case of Argentina.

In response to the challenge implied in examining a fairly diversified set of ideas, the only alternative is to go back to the situation that existed previously, because it is very difficult to analyse the extent to which objectives have been reached and, at the same time, decide which of them have still to be resolved and focalised, without first stating their origin and the reason why the reforms came about.

In order to clarify the situation it is necessary to go back to the genesis, to the “original sin”, in order to avoid making the same mistakes again. Thus it should be pointed out that the cause of the reforms is to be found in the defects of the historic social security schemes for providing pensions, in other words, the pay-as-you-go systems. These systems break down and lead to structural deficits which undoubtedly arise from the lack of balance between the

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<sup>1</sup> Executive Director of the Social Security Group Consolidar Accountant and Licentiate in Business Administration from the Universidad Nacional de Buenos Aires, Mr Peguet works as Executive Director of the Social Security Group Consolidar.

He is currently in his second term as President of the Argentine Union of Pension and Retirement Fund Administrators, a Business Association of fund management companies.

income from contributions and the benefits received, a state of affairs which has led to the correlation being increasingly de-compensated.

This situation appears to be a historical problem, and one which has been repeated over and over again, but it is important not to forget it, because it is still present and is growing ever more severe. The Annual General Meeting of the FIAP looked at the figures for the reform in Brazil, which are really surprising, and observed that this conflict is established there and is the driving force behind changes which otherwise would probably not have taken place. Learning what to do means not following that path again, because these cash-flow situations, with no real funding and with inadequate density levels, are definitely what produce the really deep modifications in our activity.

These facts make the systems untenable. The reasons why those reforms were implemented may be classified in two types, though it is worth mentioning that these were originally produced to deal with design problems with different characteristics, which will not be described here because they are explained in other documents in this book.

The first is that the pay-as-you-go model basically breaks down at the level of incentives, in the correspondence between contributions and benefits and in the exhaustion of the financial reserves needed to comply with those commitments in the future. It also falls short on transparency, information and confidentiality.

Without wishing to appear repetitive with regard to this subject, it is necessary to point out that it must be given its due importance, because when an evaluation is made as to whether the implementation of the reforms has been successful, it must be done in the light of these problems, to see whether it has been possible to improve on the previous situation in each of these points.

As has already been mentioned, there are things to be improved, particularly problems at the planning stage. However, if there is one thing to be clear about –and it should be a very strong point– it is that the pension schemes developed along the lines of private capitalization have managed to solve a series of deep-rooted difficulties which existed in the past.

The second consideration is that the previous crises, in addition to being produced by mistakes in the design of the systems which later rose to the surface, also had other origins. The context which produced them had, and still has, to do with negative aspects identified with the great vicissitudes that countries suffer, aspects such as conflicts in the labour market and the economy in general and those connected with the decrease in employment, informal work, the fall in wage-levels, evasion, etc.

It is important to state explicitly that a capitalization scheme is still subject to exposure in the same way, and this is something which occasionally produces conflicts of expectations even before it is born. Although what will be mentioned here is the subject of other articles in this book, it is necessary to affirm the existence of a virtuous circle, in which the launching of these processes may to some extent help to produce a favourable environment for solving a considerable number of these problems.

This is obviously not a panacea, but it should be made clear that the aim of implementing the reforms was to replace and provide an answer to insufficient benefits and structural design faults. In Latin America, confusion sometimes tends to arise with the belief that a wide spectrum of difficulties, such as employment, construction or the growth of capital markets, will automatically be solved by this means. However, it must be accepted that although the reforms are an important “seasoning”, they are not the only one, and a very small dose of realism would indicate that one cannot ask more of the implementation of these systems than what they are designed for, and to do so gives rise to unrealistic expectations.

The thread of this brief outline shows us that the aims and achievements in which significant progress has been made so far, as a result of these deep structural modifications, are the securing of improved benefits and the generation of a virtuous circle which helps to create social security culture, an increase in rates of saving, a tangible contribution to the development of the financial market, etc. But all this is as an additional spin-off and not the fundamental cause of the birth of the capitalization systems. It is necessary to concentrate on giving priority and commitment to obtaining the best benefits, even though the sum of the two aspects under analysis clearly produces a contribution to the growth and development of the society in which we work.

Having expressed this first set of key ideas, what is the panorama that emerges? Where should evaluation be concentrated? What are the points that go to make up the project and specifically the improvement of benefit for members or workers? Assuming this starting-point, an analysis must be made of how to approach reforms of design. This basically means thinking about what in this activity is best for the client, i.e. the worker.

This situation has to do with a simple equation, already mentioned earlier, to the effect that there is a relation in a scheme of defined contributions between the total of contributions, plus returns and minus commissions, which gives an amount of capital as a result and that is what decides the level of benefits. There are people who define this procedure as “the grocer’s bill”, a fairly simple calculation.

The point in question is that by following the sequence of this scheme while starting from the philosophy of defined benefits, a position is created in which one is trying to optimise each of these variables, without perhaps considering the last one, the required capital, which is the real objective, simply because it determines the benefit, and that is the unknown factor which interests the client and which he or she is eager to find out.

Trying to make the concept clearer, it is obvious that when one maximizes the variable of contributions or that of returns, in the end one is increasing capital. The question is whether one should not first of all, as in any business activity, start by defining what is actually required.

However much the system may be one of defined contributions rather than defined benefits, would it not be appropriate also to suggest an approach that works in the opposite direction, starting from the benefit, deciding what benefit one hopes to achieve on behalf of each of the members? Proceeding in that way will obviously make it possible to give a different dimension to this analysis compared with the other components.

When looking only at the original draft, in line with the growth of the variables mentioned, it is important to bear in mind that work is generally done and special emphasis placed on certain of those aspects, such as financial returns, which are obviously a very sensitive factor in the capital which is finally accumulated. In fact, in any study carried out, it is the most relevant, while from the

regulatory point of view there has been great concentration on evaluating the commissions structure and on the cost of the system, which, according to this line of strategy, is not so relevant in obtaining the best possible results.

With regard to the first chapter, which has to do with contributions, relatively little seems to have been done with the contribution rate, the degree of compliance and the density. It has occurred in many cases as a *de facto* element, as a piece of information which simply arrives from the macro-economic situation, when in reality it is here that the design of the scheme should contribute to ensuring that this question of contributions is not an exogenous subject, but something very concrete, built into its structure and into the management itself.

The rate of saving, the degree of compliance, the density of contributions and the system of incentives flow together to define the degree of coverage. The deduction that can be made from this assertion is that in an individual capitalization scheme it is sufficient just to reach the goals of return and costs. However, these systems in the future should incorporate the firm resolve to have a reasonable level of coverage, or build up to one, and it is no use suggesting methods based on will-power in order to achieve this. It is possible, however, to attack substantial deviations such as that which occurs with autonomous or self-employed workers, who are occasionally included in the schemes but without a specific design that reflects the way to provide them with incentives to participate and make their contributions within the collection mechanism.

It is quite common for this type of worker to have income which varies significantly over the course of the year. In view of this situation, what is the best way of collecting income when the person concerned receives it? Because, if people are included simply in order to bring them within the social security framework, but there are then no effective measures to make their participation possible and interesting, the natural result will be unsatisfactory coverage rates and there will be ongoing questioning as to why the system does not include all the people which it should potentially be able to incorporate.

The dimension of “sufficient capital” constitutes a fundamental element, in order to avoid the equation being based solely on the

maximizing of each of the variables, with the capital depending on the results of their development. In consequence, what should be done is to apply the concept of social security planning, which means identifying the amount of capital required for each client to obtain a certain replacement wage. This capital should be made up using saving rates that are neither very high nor very low and allow as far as possible for an additional savings alternative to help in building a better future. This means constantly analysing and checking the real and projected rates of return of the funds and the probable development of the mortality tables used to determine the sufficient capital.

The message emerging from this identification of factors and their consequences is that when one talks about constituting social security culture in terms of abstract or very generic appeals about the reforms and their benefits, the effect may not be the same as if each client were to be told how much capital he/she needs to have in his/her account, what the ownership of that capital actually means, the impact of his/her specific situation, how he/she differs from other people with regard to his/her previous social security history, the importance for him/her of the existence or non-existence of complementary savings, the weight of the composition of his/her family group, etc.. When all is said and done, this is an individual world which may be very far removed from the averages and even contradictory to them.

It would seem, therefore, that this is the only way to introduce this concept of social security culture, to arouse genuine interest in the system and create a healthy curiosity as to how satisfactory this scheme will turn out to be for that person's specific case.

The conclusion with regard to this second idea is that there is a lot of work to be done with members on a one-to-one basis, in terms of explaining to them how this peculiar situation works in relation to each one of them and what each person can do to improve it as far as those segments are concerned, which may mean augmenting the contributions account through additional contributions, reinforcing financial returns by using multifund options, etc. Everything explained here presupposes a series of reforms and strategy modifications which will help provide more arguments for approaching each member individually to talk about his/her future pension prospects, rather than addressing a block which is a conglomerate of averages. Those reforms may well be tax



incentives for additional saving, multifund or alternative fund policies, etc...

Just as there is a pending challenge referring to the more personalized dialogue with the workers, so it seems undeniable that any system with these characteristics requires a friendly political framework at least as part of its heritage. This needs to be one in which there is no on-going argument as to the roles of the State and the private sector in the field of social security, in which the contribution of this latter group in terms of added value is recognized, and in which there are no more recurring problems from the State in the area of managing recognition bonds or processing social security benefits, with processes that produce conflicts and are no improvement on the conditions that existed before. In the same way, it is vital to classify those cases in which difficulties arise in the area of collection and where incognitos about which functions should be performed by the public and private areas have not been sorted out.

In this context, the deciding factor lies in conceptualising the fact that these systems must be regulated, because they form part of social security and also have the enormous responsibility of receiving and managing mandatory savings which are important by their very nature. However, just as what has been said is irrefutably significant, so the need to maintain a logical balance in the cost-benefit ratio of those regulations must be fully accepted.

Finally, this activity is planned according to a long (extremely long) time-scale and it is in those long periods of time that the population begins to have doubts about whether there will be stability over time and whether the rules of the game regarding their social security savings will be respected. In order to eliminate these doubts in a convincing manner, governments must have stable legal frameworks which are not constantly changing. This does not constitute an obstacle to an enriching debate on items that call for improvement, but simply means framing them within the context of "improvements" of what already exists and not "reforms of reforms" which are disruptive to a process of consolidation and progress, both of which aspects are indispensable in giving the population the answers it longs for with regard to social security matters.

# THE VIEWS OF THE REGULATORS

MARIO GABRIEL BUDEBO<sup>1</sup>

## 1. THE INDIVIDUAL ACCOUNT PENSION SYSTEM

A pension system based on the capitalization of individual accounts allows workers full ownership of their retirement savings and protects their rights, regardless of how long they have paid contributions. As a result, there is no discrimination between different kinds of workers whose jobs are highly sporadic, such as those on low incomes or women. Basically, what is achieved is the avoidance of crossed subsidies between workers with different characteristics and different types of risks in the contributions.

The scheme of individual accounts also allows access to market returns which are beyond the range of the small saver within the alternatives offered by the financial market. On the other hand, it eliminates important aspects of moral risk, because there is no *recurrent rescue* on the State's part from the imbalances which typically occur in the other systems. Lastly, the worker sees himself as involved in the decisions concerning his/her net worth.

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<sup>1</sup> President of the National Commission of the Retirement Savings System (CONSAR). Mr Budebo graduated in Economics from the Instituto Tecnológico Autónomo de México (ITAM). He obtained a Master's degree and studied for a Doctorate in Economics at the University of California, Los Angeles (UCLA). He has held various posts in the Treasury and Public Credit Department of the Federal Government, among them Director General of Development Banking, Director General of Income Policy, General Coordinator of Income and Fiscal Coordination Policy and Coordinator of Advisors to the Treasury and Public Credit Department. He is Professor of Public Finance and Private Finance at the ITAM in the Licentiate and Master's courses in Economics and in Public Administration. He has been a speaker at a number of international seminars on matters of Fiscal Policy and has published various articles on these subjects.

The individual capitalization systems also offer advantages for economic development. Except for the guaranteed payments that have to be made by the State, fiscal contingencies are avoided, due to the endogenous balance between contributions and benefits. There is evidence suggesting a strengthening of financial saving, particularly long-term saving, which is essential for the country's development<sup>2</sup>. The investment of workers' resources makes it possible to finance companies long-term and in local currency, which avoids considerable risks, especially those related with fluctuations in exchange rates. Finally, it stimulates the building of public infrastructure at state and municipal level, providing an incentive through this system for fiscal discipline in the sub-national governments themselves.

## **2. REFORMS IN LATIN AMERICA AND EASTERN EUROPE**

The pension reforms in various countries in Latin America and Eastern Europe became necessary because of the wide imbalances between the present value of the contributions and the benefits. This is a result of the aging of the population, which has upset the ratio of active workers to pensioners. In the case of the Latin American countries, and of some in Eastern Europe, the institutional, social and economic conditions made reform more feasible than in more developed countries. These conditions had to do mainly with the level of the actuarial deficit of the pension systems and the dynamics of the population in those countries.

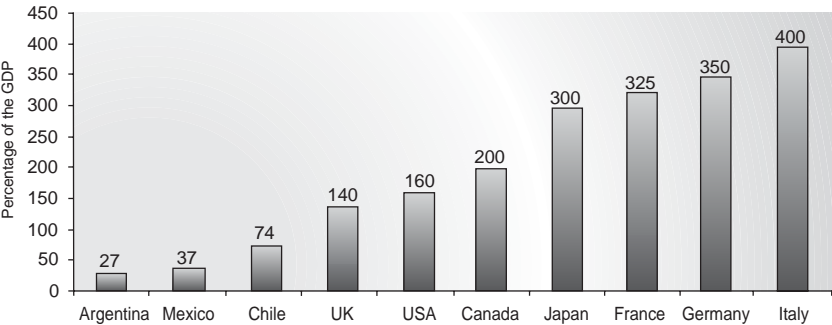
The actuarial deficits of the systems in the Latin American countries were significantly lower than those existing in developed countries. Thanks to this, the Latin American countries allotted a relatively small amount of funding to cover pensions that were already being paid, compared with the sum that developed countries would have to find.

Whereas in the case of the Latin American countries, the annual contributions needed to cover pensions already being paid and to capitalize the accounts amounted to between 1% and 2% of the GDP, European countries would have to channel resources in the

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<sup>2</sup> See paper by Klaus Schmidt-Hebbel given at this seminar.

**Figure N° 1**  
**IMPLICIT SOCIAL SECURITY DEBT**

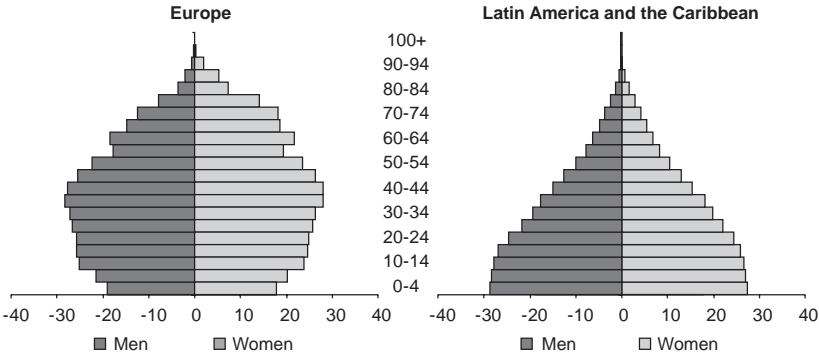


Sources: Palacios, 1999, for European countries and Mesa-Lago, 2000 for Latin American countries.

order of 9% or 10% of the GDP to that end. This may explain in part why it has proved difficult to reform pension systems in the developed countries, rather than any questioning of the benefits of the capitalization system in itself.

On the other hand, the population structure of the Latin American countries contained a larger proportion of young people than in Europe. This contributed to support for the reform.

**Figure N° 2**  
**DEMOGRAPHIC STRUCTURE IN 2000**  
(THOUSANDS OF PEOPLE)



Source: UNO

### 3. THE SYSTEM OF INDIVIDUAL ACCOUNTS AND ITS IMPACT ON THE FINANCIAL SYSTEM

The individual capitalization accounts constitute a powerful instrument for accumulating financial savings<sup>3</sup>. The total of the pension fund portfolios depends on the length of time that the reformed systems have been in operation. Chile, with the oldest of the Latin American systems, has a total which has reached a level of over 50% of the Gross Domestic Product.

According to estimates made by the financial firm Salomon Smith Barney, the importance of the Latin American capitalization systems in relation to the GDP will increase significantly. Mexico, Colombia and Peru are likely to be the countries with the highest growth rates in the region over the next twelve years (see table 1). According to these projections, the resources in the Mexican pension system could represent 26% of the GDP by the end of that period, while in Chile they could reach 90% of the GDP, though at a lower rate of growth.

**Table N° 1**  
**ESTIMATED GROWTH OF PENSION**  
**SYSTEMS IN LATIN AMERICA**

Country	Total Assets (US\$ million)		Annual Growth (%)	Total Assets (% of the GDP)	
	2000	2015		2000	2015
Argentina	20,381	57,023	7.1	7.2	30.9
Bolivia	2,395	5,884	6.2	24.8	43.5
Chile	35,869	95,338	6.7	48.5	89.7
Colombia	3,580	26,825	14.4	4.3	24.7
Mexico	28,201	247,887	15.6	5.0	26.0
Peru	2,750	26,813	16.4	5.1	28.1
Uruguay	816	1,942	6.0	3.7	13.3
Total/Average	167,867	638,290	9.3	10.0	30.8

Source: Private Pension Funds in Latin America, 2002, Salomon Smith Barney

<sup>3</sup> Klaus Schmidt-Hebbel.

In Mexico, the portfolio of the Siefors (pension funds) was worth 32 thousand million US dollars at close of March 2003. The Siefors were positioned as the fourth largest intermediary in the Mexican financial system, representing 10% of the total assets handled by the various intermediaries. This has been the component of the national financial system that has grown most in the five years that the new pension system has been in operation.

According to Consar estimates, by 2020 the share of the Afores in the local market could represent 30% of all the assets in the financial system.

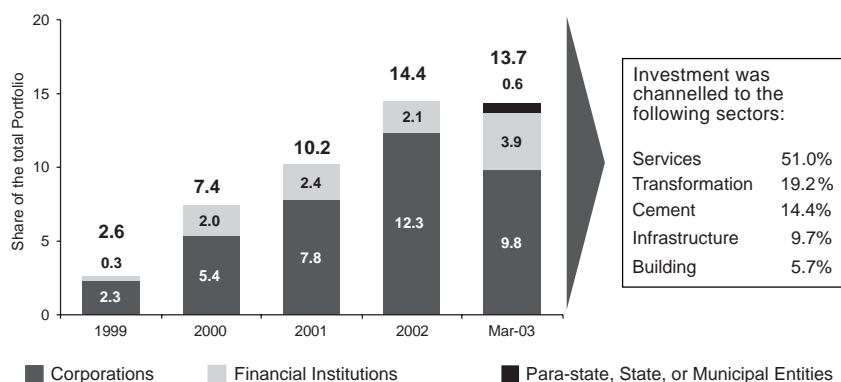
In 2002 the growth of the Afores contributed 27% to the total increase in financial savings. Though the Afores represent only 10% of financial savings, their contribution to growth in this area is almost three times greater than one would expect from their size in terms of assets. This shows the importance that the system of individual accounts is acquiring in the national financial system.

The increase in financial savings derived from the pension system has also contributed, among other factors, to producing certain changes in the composition of debt, in both the public and private sectors. As regards government debt, it has contributed to the change in composition from foreign currency to local currency. The debt in local currency rose from 29% of the total debt in 1997 to 51% in 2002. In addition, it has contributed to a change in the profile of the debt, from short to long term. In 1997, long-term debt represented 47% of the total, whereas in 2002 this percentage had grown to 74%.

Where the private sector is concerned, the increase in resources from the Afores has allowed improved diversification of portfolios, with investments in that area which represented 14% of the total Siefors portfolio by close of March 2003. Investments in private instruments rose from US\$356 million in December 1999 to US\$4,546 million in the same month in 2002, with an average growth of 134% per year.

The resources which the Siefors allot to productive activities contribute 8.4% of the total funding granted by the financial system to this sector.

**Figure N° 3**  
**SHARE OF PRIVATE INSTRUMENTS**  
**IN THE SIEFORES PORTFOLIO**



#### 4. TOWARDS A NATIONAL PENSION SYSTEM (NPS)

One of the objectives that the National Commission of the Retirement Savings System has set itself is to contribute towards the development of a national pension system. We believe that the construction of this system should be based on four aspects:

1. **Social sustainability.** The pension system must produce replacement rates which allow workers adequate levels of self-sufficiency at the end of their working lives.
2. **Coverage.** The whole population must have access to the financial and social mechanisms which allow them to accumulate resources for their retirement. At present only half the economically active population has access to these.
3. **Financial sustainability.** The pension plans must be financially viable. Given the pattern of worldwide aging, the defined benefit schemes face serious actuarial imbalances.
4. **Portability.** The NPS must allow workers to accumulate their individual rights, regardless of the sectors in which they have worked, and have precise rules for transferring reserves from one social security institution to another.

## 4.1. Social sustainability

In order to achieve social sustainability, it is necessary to create conditions for increasing the balance in the individual account and increasing replacement rates, which are still very low in Mexico and other countries. To do this, there are four elements which we must take care of: mandatory contributions, voluntary contributions, returns and commissions.

### 4.1.1. Contributions

Mandatory contributions in Mexico are low, if one excludes the housing sub-account. This sub-account is a contribution paid by the employer on the worker's behalf (5% of the wage), which may be converted into a housing loan. If the balance is not used for housing, it is absorbed into the retirement balance to increase the pension when the worker retires. It is an interesting fact that 80% of workers add that 5% to the amount to be used for their pensions and only 20% actually use the housing resources in order to obtain a loan.

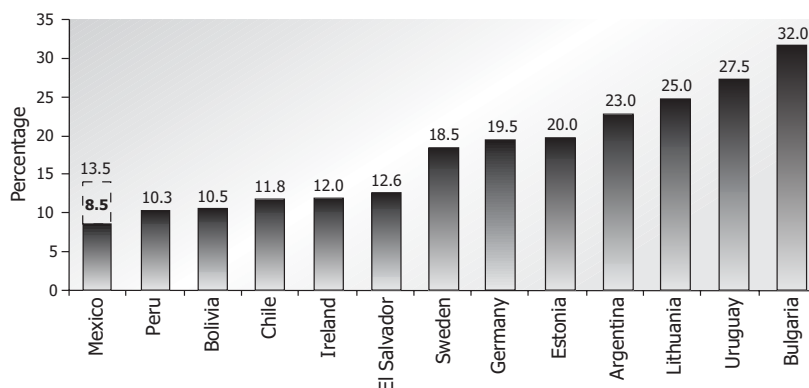
Pensions in developed countries depend to a large extent on voluntary savings, which complement the pensions. In some countries the voluntary savings component is as much as 50% of the total pension, achieving a replacement rate of about 65% to 70%. This represents a very important challenge for the Latin American pension systems.

In Mexico, the replacement rates achieved with the mandatory contributions are 40% to 60%, while the voluntary part contributes a very small percentage indeed. Though voluntary contributions represent less than 1% of the total with regard to the balance of the pension system, they signify 2% of the flow. This means that their dynamics are going in the right direction, though still insufficiently.

In order to increase these contributions, changes were recently made in the pension system law to include a new account for voluntary contributions, which have been given the name of "complementary contributions". The benefit of this is that the contributions are tax-deductible. At present methods are being studied to make the deduction simple and attractive to the workers.



**Figure N° 4**  
**CONTRIBUTIONS FOR RETIREMENT IN THE PENSION SYSTEMS**  
**(PERCENTAGE OF WAGE)**



Notes: The data for Mexico includes RCV and social dues expressed only as a percentage for a worker with an income of three minimum wages. In the case of Argentina, both pillars are included.

Source: Statistical Bulletin of the AIOS, December 2002; IDB, "Towards responsible ageing", 2002; OCDE Private Pension Series: Private Pensions Conference 2000, N° 3; OCDE, Private Pension Series: Administrative Costs and Reforms.

#### 4.1.2. Returns

Meanwhile, it is necessary to take action on three fronts in order to improve the risk-adjusted returns:

- Adapt the investment system gradually and prudently, in order to achieve adequate diversification.
- Introduce risk control that is consistent with the aim of providing the greatest possible security for workers' savings.
- Improve the return on the housing sub-account, which in many cases represents approximately 40% of total contributions.

There have been significant changes in this direction during the past few years in the investment system governing the Afores and these have made it more possible for the Siefors to diversify their investments by issuer and by currency. In addition, the regulations have been modified to establish investment limits on the basis of the credit rating of the instruments and not by the type of issuer. This has eliminated a series of barriers and limitations which our investment system used to have, and in a year or two this will begin to be reflected in a more diversified portfolio composition.

#### *4.1.3. Commissions*

The subject of commissions is a very important and controversial one in the countries of Latin America. There is still much to be done in order to step up competition in the industry and so make it possible to bring down commissions.

If we separate the commissions of each country by quartiles, we will observe that Mexico is in the lowest position for the whole region in the first two. But we will also observe that Mexico is in third place among the cheapest commissions (on average) in the fourth quartile. This means that while some of its administrators have the cheapest commissions in the region, it also has some of the most expensive, thus increasing its dispersion. So, if the decision of the clients –the workers– to take their resources to the administrators were to be linked to lower commissions, the Mexican system could see important savings,

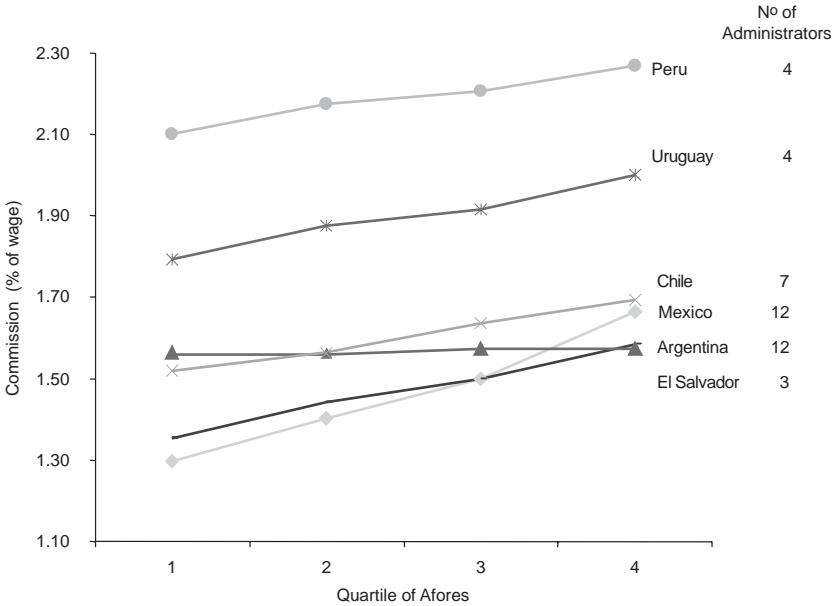
If a real effort is made to provide the worker with information, so that he/she can make an informed decision, competitive conditions will be created which will encourage the administrators with the higher commissions to reduce them, and that would produce a lower average commission.

#### **4.2. Coverage**

The other big subject in the national pension system is coverage. Taking into account the different pension systems which exist in Mexico, there is still a considerable sector of the population which does not participate in a formal pension plan. This sector represents 23 million people (see figure 6), and one of the challenges is to work towards a social security system which extends to this section of the population. To do this, certain changes have been introduced recently in legislation, such as the possibility of Civil Servants being allowed to take part in the individual account system. It should be remembered that in Mexico this sector of workers still has a defined benefit pension system.

Another change is that self-employed workers and those in the informal sector of the economy can make voluntary deposits and contributions in an individual account managed by the Afores. In the same way, it was also made possible for workers

**Figure N° 5**  
**COMPARISON OF MEXICAN COMMISSIONS**  
**WITH THOSE OF THE REST OF LATIN AMERICA**



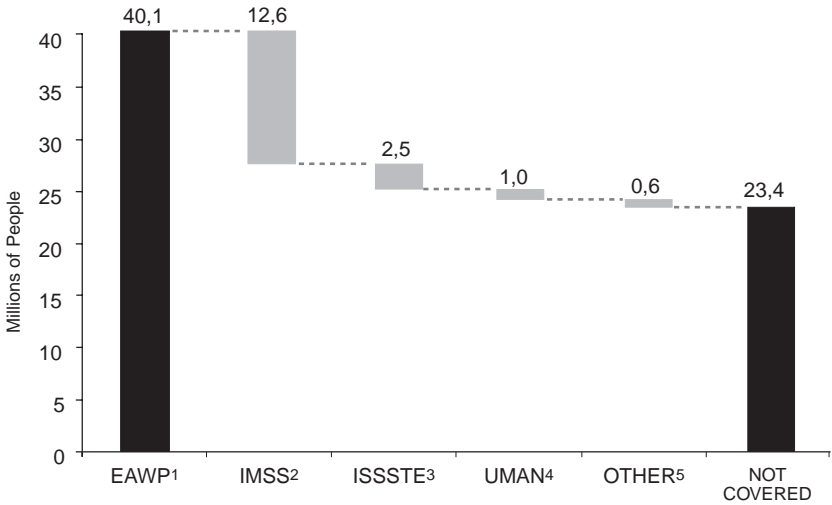
Source: Statistical bulletins of each of the Superintendencies for December 2002. The quartiles were calculated on the basis of the number of administrators using the simple average of the administrators involved in each quartile.

For Mexico the simple average of the equivalent commission over flow at 25 years was used with an initial balance of zero for each of the Afores involved for observation. Data as of the end of March (including Azteca and Actinver and eliminating Tepeyac).

in public offices and institutions, both state and municipal, to contribute voluntarily in an individual account, if their employer opts in favour of allowing the social security funds to be managed by an Afore. This is a move in the direction of extending coverage and encouraging, or providing access to, the possibility of paying voluntary complementary contributions in order to raise pensions.

Other changes have to do with the possibility of the Afores managing the pension funds of private companies, States, Municipal Authorities and government companies and agencies.

**Figure N° 6**  
**POPULATION WITH SOME FORMAL PENSION PLAN**



<sup>1</sup> EAWP Economically active working population

<sup>2</sup> IMSS: data for November 2002

<sup>3</sup> ISSSTE: data for June 2002

<sup>4</sup> Ham Chande, Roberto: "The Future of Pensions". UNAM

<sup>5</sup> Includes: ISSFAM, PEMEX, CFE, LFC, Universities

Sources: INEGI: Census of Population and Housing 2000, Social Security Institutes and First Government Report.

## 5. CONCLUSIONS

The system of individual accounts or capitalization is obviously the best option for a sustainable pension system. In order to achieve a situation in which the benefits offered by this system are extended to the whole population and pensions are guaranteed for all workers, it is necessary to advance in the direction of a National Pension System. This means achieving social sustainability, extending the system's coverage, inducing financial sustainability in the systems which are outside the capitalization system today, and achieving portability of the workers' resources in the medium and long term.

# EVALUATION OF REFORM EXPERIENCES IN EASTERN EUROPE

AGNIESZKA CHLON-DOMINCZAK<sup>1, 2</sup>

## INTRODUCTION

The economic transition brought about significant changes in the functioning of pension systems in Central and Eastern Europe as well as in post-soviet countries. Existing pay-as-you-go systems were in most cases downscaled and the level of pension protection decreased. At the same time, development of market economy in general and financial markets in particular gave an opportunity for the development of private pension savings.

In the mid-1990s, voluntary pension funds were developed. In 1994, legislation that allowed for creation of voluntary private pensions was implemented in Hungary, Czech Republic and Bulgaria. In the case of Hungary and Bulgaria, it preceded the

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<sup>1</sup> This study was prepared with the assistance of the International Federation of Pension Fund Administrators (FIAP), in co-operation with the World Bank.

I would like to thank Augusto Iglesias and Robert Palacios for their comments and suggestions to the earlier draft of this paper and Dorota Wijata for research assistance. Valuable comments were provided by Nikola Abadjiev, President of the Bulgarian Association of Supplementary Pension Security Companies, and Kadi Odun of the Ministry of Finance in Estonia.

<sup>2</sup> Director of the Department of Economic Analysis and Prospects at the Ministry of Economics, Labour and Social Policy of Poland. Consultant at the World Bank.

Ms Chlon was a member of the team for reforming pensions in Poland, from December 1996.

From September 1998 onwards she was Executive Director of the Government Office for Social Security Reform, a job which finished in April 1999.

She worked as an economist at the Gdansk Institute for Market Economics and continued working as an advisor to the Government for the pension reform process.

She has advised various countries on their pension reform processes, including Russia, Estonia, Latvia and the Slovak Republic.

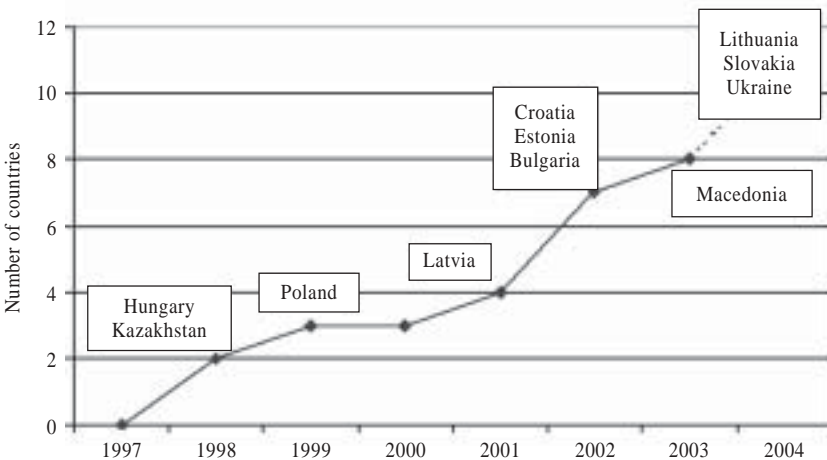
She is the author of various publications in the fields of pension systems and labor economics.

implementation of mandatory pension funds. In the Czech Republic, the funded pension provision remains solely on a voluntary basis. Voluntary pension systems are quite popular in these countries, while in the rest of the Central and Eastern Europe, they did not manage to attract many participants, though appropriate legislation was developed also in other countries.

Creation of voluntary savings was a first step towards systemic pension reforms that led to the development of multi-pillar pension systems with mandatory funded components. By 2002, eight countries in Eastern Europe and in the former Soviet Union had introduced systemic pension reforms. As a result of these reforms, mandatory funded schemes were developed. First universal mandatory funded systems were created in Hungary and Kazakhstan in 1998. Afterwards, other countries followed. The idea of mandatory funded systems is also spreading in other countries, which are currently discussing the implementation of such a solution (Figure N° 1).

This paper aims to analyse the design and experience of mandatory funded pension systems in the abovementioned countries. Though

**Figure N° 1**  
**CREATION OF UNIVERSAL MANDATORY FUNDED PENSION**  
**SYSTEMS IN CENTRAL AND EASTERN EUROPE**



a move towards funded schemes usually follows the multi-pillar regime, there are different choices among countries regarding the coverage, size and structure of funded schemes. The issues that this paper attempts to address are firstly, why such differences exist, secondly, are there any “best practices” that emerge from the early experience, and thirdly, what are the necessary conditions for further developments of funded schemes in the region.

The paper is structured as follows: the first chapter describes the demographic, economic and social situation in the analysed countries, pointing out possible reasons for the pension reform introduction; the second chapter describes the transition to the new pension system, including cohorts covered by the regulation, valuation of past rights, adjustment in the pay-as-you-go formula and financing the transition costs; the third chapter describes the design of the funded pension systems, including contribution size, administrative regulation, licensing and investment requirements; the fourth section shows preliminary experiences in the implementation of pension reforms and the fifth section concludes.

The research in this paper was supported by FIAP. In particular, a survey was distributed among countries which provided necessary information. Organisations that contributed to the research with data include: Bulgarian Association of Supplementary Pension Insurance, Ministry of Finance in Estonia, Hungarian Financial Supervision Authority, World Bank offices in Croatia and Latvia, Ministry of Economy, Labour and Social Policy in Poland, Pension Fund Association and Central Bank of Kazakhstan and Actuarial Unit of the Pension and Disability Insurance Fund in Macedonia. Additional information was drawn from national statistical offices data and appropriate legislation.

## **1. THE NEED FOR PENSION REFORM**

There are several reasons of pension reforms in the analysed countries. One of them is the process of ageing populations causing an increase in the number of persons of retirement age and a decrease in the number of persons of working age. Another one is an inherited design of pension systems with a very low retirement age and somewhat limited link between contributions and benefits that discouraged participation in the pension system. This chapter contains a comparison of the demographic developments and

functioning of pre-reform pension schemes in the analysed countries, explaining the rationale for the pension reforms.

### **1.1. Ageing process**

Demographic ageing is a result of both increasing life expectancies of the population and lower fertility. Increased life expectancies mean a larger number of persons receiving old-age pensions for longer periods of time. Decreased fertility rates result in a reduced working-age population in the future. As a result, old-age dependency rates, measuring the ratio between persons of post-working and of working age, increase.

Changes in fertility patterns that are observed in the Central and Eastern Europe show the signs of the second demographic transition (see: Van de Kaa, 1987). Changes in the traditional model of family lead to larger numbers of single-person households and informal relationships that are the reason of further decrease in the fertility. Fertility rates are particularly low in Bulgaria, Latvia, Hungary, Estonia and Poland: in 2002 they were below the level of 1.4<sup>3</sup>. Only in Kazakhstan has fertility remained at a relatively high level (in 2002 it was 2.12).

Life expectancies at birth also differ among countries. The highest life expectancy can be observed in Macedonia (72 years for men and 77 for women) and the lowest in Kazakhstan (58 for men and 70 for women). In all the countries, life expectancies are lower than in most developed countries, which for 2000-2005, according to UN population projections<sup>4</sup>, are equal to 72.1 in the case of men and 79.4 in the case of women.

The ageing process is most advanced in Bulgaria, where dependency rate is close to 25 per cent, compared with around 10 per cent in Kazakhstan, which has the youngest population. Demographic projections show that in all countries in the future the share of population aged above 65 will increase, while the share of population of working age will decrease. As a result, the dependency rates will at least double in all the countries by 2050

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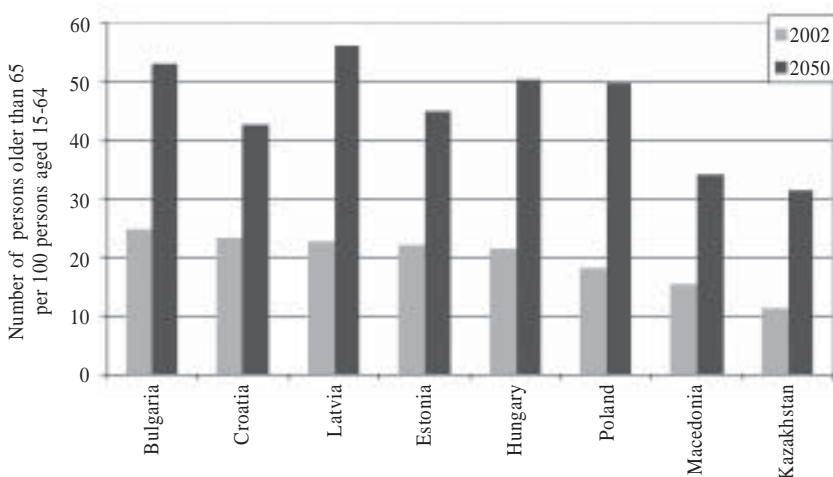
<sup>3</sup> In order to assure the simple reproduction of the population, fertility should remain above the level of 2.2

<sup>4</sup> UN Demographic projection, 2002 revision.



(Figure N° 2)<sup>5</sup>. The ageing is expected to be particularly deep in those countries that currently have the lowest fertility rates.

**Figure N° 2**  
**OLD-AGE DEMOGRAPHIC DEPENDENCY RATES**



Source: own calculations based on the UN population projection and country sources (Macedonia and Estonia)

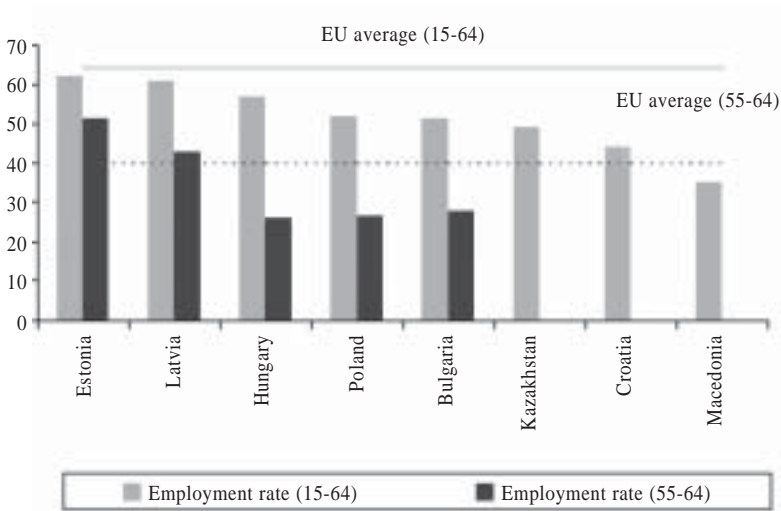
## 1.2. Labour markets and pension systems

While the demographic situation in the countries is currently quite favourable, the transition and change in the labour demand affect the activity level of the working age population (Figure 3). Employment rates in all of the analysed countries are below the current EU level. In five of the analysed countries not more than half of the working-age population actually works. In particular, employment rates of older workers (55-64) are very low - in Hungary, Poland and Bulgaria less than a third of this age group works.

Low employment rates have a significant impact on pension systems. Firstly, there are fewer workers to pay pension contributions. Secondly, there is a strong political and social demand for early retirement options in order to provide those without jobs with stable income.

<sup>5</sup> For detailed information on demographic characteristics see tables A.1-A.2 in the appendix.

**Figure N° 3**  
**EMPLOYMENT RATES IN 2002**



Note: For Kazakhstan and Croatia - activity rates for 2001

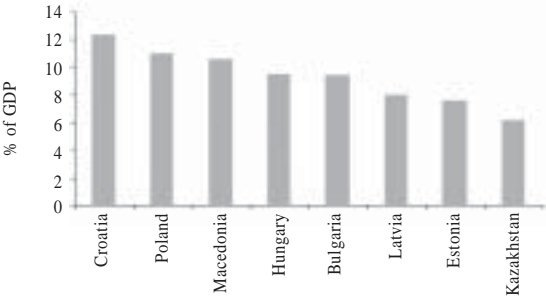
Source: Eurostat; Macedonia, Croatia and Kazakhstan - country sources

As a result of these tensions, effective retirement age was usually at the level of 55 for women and 60 for men. Various early retirement privileges served as a ‘buffer’ for the transition time, where an abundant workforce without proper skills needed to be deactivated. Consequently, pension expenditures were growing, along with social security contributions, creating significant obstacles for job creation and the economic growth in the countries. Most of the pension systems were also running increasing deficits, creating an additional burden for public finance.

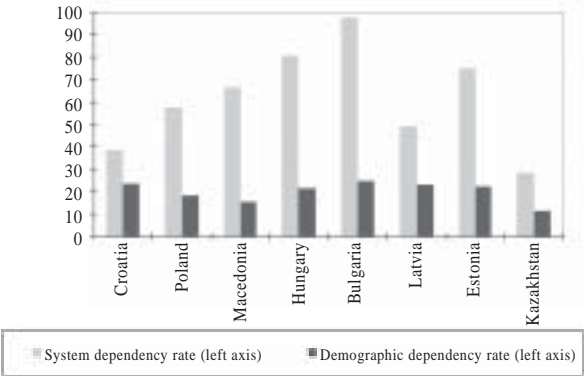
Figure N° 4 shows the main characteristics of the pension systems. In 2002 the level of pension expenditures ranged from 12 per cent in Croatia to 6 per cent in Kazakhstan. The expenditures are related to the relative generosity of the pension system measured by the value of the average pension in relation to the average wage and the number of pensioners in relation to contributors. In all of the countries, there is a significant difference between demographic dependency rate and system dependency rate. A significant proportion of working age people are not employed and do not contribute the system, as most of them are already retired.

**Figure N° 4**  
**MAIN PENSION SYSTEM CHARACTERISTICS IN 2002**

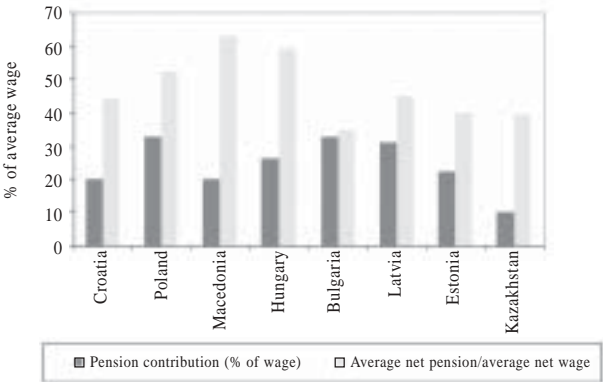
a. Pension expenditure (% of GDP)



b. System and demographic dependency rates



c. Contribution level and replacement rates



Poland: employee pension system.

Latvia: Data for 2001.

Kazakhstan: prior to pension reform contribution rate was 25.5% of wage.

Source: own calculations based on country sources and FIAP survey.

The coverage (i.e. number of contributors compared to the number of employees) is relatively high among the analysed countries. Additionally, some portion of people of working age are already retired. Pensions in relation to wages are also quite different between countries. They range from as much as 63 per cent in Macedonia to 35 per cent in Bulgaria.

In some of the countries, where system dependency rates are lower, systems offer higher benefits, (Croatia and Poland). That results in a relatively large share of the GDP being devoted to pension payments.

### **1.3. Implicit pension debt and need for reforms**

Demographic developments combined with existing labour market policies and the design of pension systems show the necessity for the reform of the pension systems. Current policies resulted in rising implicit pension debt (IPD) that would constitute a significant burden for future populations. Holzmann, Palacios and Zviviene (2001) compare the size of implicit pension debts for 26 low and middle-incomes using consistent methodology. The sample included five out of eight countries considered in this paper, shown in Table N° 1. In Kazakhstan, the IPD is lower and according to Andrews (2001) amounts to some 110 per cent of the GDP.

Given the high level of IPD, comprehensive reforms of the pension systems were necessary. Most of the countries decided to introduce a gradual increase of retirement ages or a reduction of the pension indexation level. However, these actions were not sufficient to regain the stability of pension systems and further changes were necessary. Radical pension reforms with partial or full privatisation were adopted. Mueller (2003) identifies several triggers for such processes. The first one is the crisis of existing systems which, as shown above, applies to all analysed countries. The second is strong political leadership, often with governing parties that implemented the neo-liberal agenda known previously for their left-wing or populist leanings. Local interest groups, such as business and financial organisations as well as international financial institutions, also often supported partial privatisation of pension systems. There was also a macroeconomic motive to embark on a virtuous circle leading to economic growth.

Chlon and Mora (2003) confirm these hypotheses. They present the results of an international survey of politicians and experts,

**Table N° 1**  
**PUBLIC AND IMPLICIT DEBT FOR SELECTED**  
**COUNTRIES IN CENTRAL AND EASTERN EUROPE**

Country	Public debt 1999/2000	IPD by discount rate		
		2%	4%	5%
As share of GDP				
Macedonia	41	441	291	244
Poland	43	379	261	220
Hungary	59	300	203	171
Croatia	33	274	201	175
Estonia	7	268	189	163

Note: The IPD calculation already includes some changes in the pension systems (i.e. increasing retirement ages in most of the countries, changes in the pay-as-you-go system in Croatia and Poland or the introduction of a multipillar scheme in Hungary).

Source: Holzmann et al (2001)

which state that fiscal deficit and the credibility crisis of pension institutions lead to pension reforms. International institutions and financial market institutions also play important roles in the pension reform in CEE countries (higher than average), which might also explain the shift towards funded systems. From a political economy perspective, the reform strategy was also often to bundle unavoidable yet politically sensitive reforms of the public PAYG tier with the more visible introduction of funded, defined contribution tiers (Holzmann, 2000; Lindeman, Rutkowski and Sluchynskyy, 2000).

## 2. DESIGN OF THE NEW SYSTEMS

Most of the analysed countries (except Kazakhstan) decided to introduce multi-pillar pension systems. The approach to the multi-pillar concept in all of the countries aims at providing ways of allocating income over the life cycle with a different way of financing. Holzmann (2000) argues that such systems have several

advantages: they allow a distinction to be made between poverty reduction and income replacement goals, they build risk diversification into a country's provision for retirement income support; they minimise the burden of fiscal transition while preserving many of the economic gains of the fully-funded approach, and they bring to the reform discussion some clear gains for younger workers and those who are facing labour income losses from globalisation.

There are four levels of pension provision that comprise mandatory pension systems in the analysed countries. These include:

- (i) A basic income guarantee in a form of a minimum pension built explicitly into the first pillar or in a form of a state budget subsidy, topping up benefits received from all mandatory parts of the system;
- (ii) A first pillar that is mandatory and managed either directly by government agency or quasi-governmental institution financed on the pay-as-you-go basis;
- (iii) Second pillars, managed by private institutions, with participation mandated by law financed on a full reserve basis, under which financial assets are accumulated to help finance future retirement benefits;
- (iv) Third pillars, constituting voluntary pension savings in the form of occupational or individual pension plans.

In each of the countries, the size and relative role of each pillar is designed in a form of structural compromise, taking into account their economic situation, political preferences and social history. Overall design of the implemented systems is presented in Table N° 2. The design of the basic income guarantee, relative size of mandatory pillars based on the level of pension contribution (including the limit for the pension provision) and the design of pay-as-you-go pillars are presented below. The analysis is presented from the perspective of the changes made to reinstate its financial sustainability and the transition from pay-as-you-go mono-pillar to multi-pillar or funded systems.

## **2.1. Basic income guarantee**

One of the most important aspects of pension provision is providing older people with adequate income for old age. Most countries design their pension systems to assure that their aged and disabled

**Table N° 2**  
**COMPARISON OF MULTI-PILLAR AND FUNDED PENSION SYSTEMS**

Characteristics	Kazakhstan	Hungary	Poland	Latvia	Bulgaria	Croatia	Estonia	Macedonia
Reform type	Substitutive	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
Target retirement age	58/63	62/62	60/65	62/62	60/63 65/65 for minimum pension provision	60/65	63/63	62/64
<b>Public mandatory tier</b>								
Design	Closed down	Traditional PAYG scheme; private tier complementary	NDC scheme; private tier complementary	NDC; private tier complementary	Traditional PAYG scheme; private tier complementary	Traditional PAYG scheme; private tier complementary	Traditional PAYG scheme; private tier complementary	Traditional PAYG scheme; private tier complementary
Modification of pension rights		Reduced accrual rates	Individual contribution adjustment	Individual contribution adjustment	Reduced accrual rates	Reduced accrual rates	Reduced accrual rates	Reduced accrual rates
Benefit indexation	Only minimum pension is indexed. Remaining part is kept at nominal value	50% prices 50% wages	80% prices 20% wages	Mixed price/wage indexation	Mixed price/wage indexation	50% prices 50% wages	50% prices 50% wages	80% prices 20% wages
<b>Private mandatory tier</b>								
Design	Individually fully funded	Individually fully funded	Individually fully funded	Individually fully funded	Individually fully funded	Individually fully funded	Individually fully funded	Individually fully funded
Providers	Private and public	Private	Private	Private and public	Private	Private	Private	Private
Implementation	1998	1998	1999	2001	2002	2002	2002	2003
<b>Private voluntary tier</b>								
Implementation	1998	1994	1999	1998	1994	2002	1998	2003

Note: In Bulgaria mandatory occupational pension funds were established from 2001, covering mandatory early retirement system for workers working in hard or hazardous conditions.  
Source: own modification based on Mueller (2003)

citizens, particularly those who have spent long careers working, have access to a minimum level of income that is provided to them in a dignified manner. Countries that have a formal, multi-pillar system structure the first pillar to achieve this objective explicitly, by establishing a minimum pension guarantee, which is separate from the income replacement role of the pension system, or through the state guarantee on top of both mandatory pillars of the pension system. Table N° 3 presents the level and qualifying conditions for minimum pension provision in analysed countries.

**Table N° 3**  
**MINIMUM PENSIONS SIZE AND FINANCING**

Country	Minimum pension level (% of average wage in 2002)	Qualifying period (women/men) %	Structure of the guarantee
Hungary	17	20/20	Financed from the state budget
Kazakhstan	20	20/25	Financed from the state budget, topping-up pensions received from the funded pillar
Poland	30 <sup>1</sup>	20/25	Financed from the state budget, topping-up pensions received from the first and second pillars.
Latvia	17	10/10	In the first tier, financed from social security contributions.
Croatia	10.5 <sup>2</sup>	15/15	In the first tier, financed from social security contributions.
Bulgaria <sup>3</sup>	19	15/15	In the first tier, financed from social security contributions.
Estonia	13	5/5	In the first tier, financed from the state budget
Macedonia	41 38 35	Over 30/35 years Over 20/25 years Over 15 years	Financed from social security contributions, topping-up pensions received from the first and second pillars.

<sup>1</sup> Relative to average wage net of social security taxes

<sup>2</sup> For minimum qualifying period, increases in the case of longer service

<sup>3</sup> People who do not fill the eligibility conditions receive social pensions from the state budget (paid for those older than 70 years of age, based on means test).

Source: own calculations based on country sources and FIAP survey.



There are several observations that emerge from the comparison of minimum guarantees. There are quite significant differences both in the size of the provision (relative to average wage) and qualifying conditions between countries. In relative terms the difference between the country with the highest minimum guarantee (Macedonia) and the lowest minimum guarantee (Croatia) is about four times. Also the length of qualifying periods differs quite significantly. The differences in the levels of minimum pensions are also interesting in comparison with the average pension size. The relation between these two is lowest in Poland, Macedonia and Bulgaria (under two) and highest in Croatia (over four).

Though there are differences in the level of minimum pension provision, the minimum pensions are designed to provide protection against poverty. Given that, the level of this guarantee should be adequate to this purpose, which may lead some of the countries to revise the level of the minimum guarantee in the future. Another issue relates to the role of funded systems in pension provision. In some of the countries, despite the mandatory character of the funded pillar, it is not included in the minimum pension guarantee that is applied only to pay-as-you-go pensions. This seems to contradict the nature of multi-pillar systems, which is to diversify the risk, and also from the public finance perspective. Additionally, if the minimum guarantee is built into the pay-as-you-go system, it is financed from the contributions of the insured. It means that there is no distinction between the poverty protection and income replacement role of pay-as-you-go pillars, while funded pillars serve purely the purpose of income replacement.

## 2.2. Relative size of the pillars and size of pension coverage

The size of pension provision and the relative size of pillars, measured by contribution rates for pension insurance, differ between the countries. In all the cases, contributions in funded scheme finance only old-age insurance<sup>6</sup>, while the first pillar contribution covers also disability and survivor risks. In the case of Poland and Latvia, old-age contribution is separated from non

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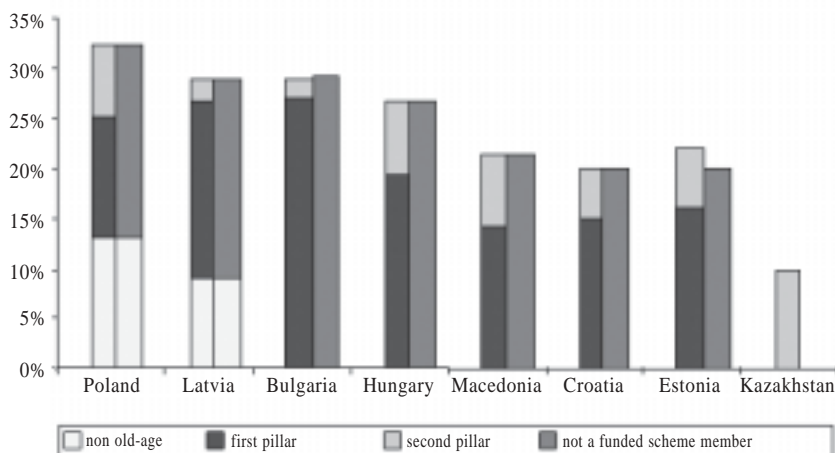
<sup>6</sup> Namely, no part of contribution paid to funded scheme finances special annuity paid in case of disability or survivor risk. In some of the countries, there are specific provisions that might indirectly cover the disability or survivor risk (i.e. purchase of joint annuities, or transfer of savings to public scheme, responsible for disability pension payment). These provisions are discussed in section 3.9.

old-age. In Bulgaria and Croatia, the contribution covers pensions risk (including old-age, disability and survivor), while in other countries it covers all types of social insurance risks (including sickness and work injury).

Figure N° 5 shows the size of contribution rates to PAYG and funded pillars in the case of funded pillar participants and the contribution for those who do not participate in the funded scheme. Most of the countries decided to deduct the contribution to the funded pillar from the existing contribution level. In that way, the cost of contribution for switchers and non-switchers is the same. Estonia chose another option - the contribution rate for funded pillar participants is higher. Kazakhstan replaced pre-reform 25.5% contribution with 10% contribution to funded pillar and the rest, in the form of tax, financed accrued pensions from the old system as well as other benefits (i.e. disability and survivor pensions).

The contribution level to funded tiers is significantly smaller than contributions to the public system. As a result, a larger share of future pensions will be paid from the pay-as-you schemes. The

**Figure N° 5**  
**PAYG AND FUNDED CONTRIBUTIONS**  
**IN ANALYSED COUNTRIES (2002)**



Source: own calculations based on country sources and FIAP survey.

role of the funded tier is seen as a complementary component, helping the insured to get better pension provision than would otherwise have been possible.

In some of the countries the size of second pillar contribution is planned to increase in the future, changing the relative role of pay-as-you-go and funded pension provision. In other countries -presented contribution levels are intended to remain unchanged in the future (see Table 4).

Hungary, Latvia and Bulgaria are planning to increase the level of the funded contribution. As a result, transition costs related to the transfer of contribution are lower at the beginning, when pay-as-you-go pension expenditures are higher. With time, as pay-as-you-go pension costs decrease, contributions to funded pillars can be higher. However, such a policy is quite risky, as politicians may decide not to increase contributions in following years, according to the planned schedule. It happened for example in Hungary, when the planned increase of contribution from 6% to 7% was delayed for four years.

Another important design element is setting the minimum and maximum level of insurable income. The minimum level of insurable income is established directly or indirectly in Bulgaria and Poland. In Bulgaria, minimum monthly income is defined by activity and by occupation, for the self-employed it is set at a level

**Table N° 4**  
**DESIGN OF CONTRIBUTIONS TO FUNDED TIERS**

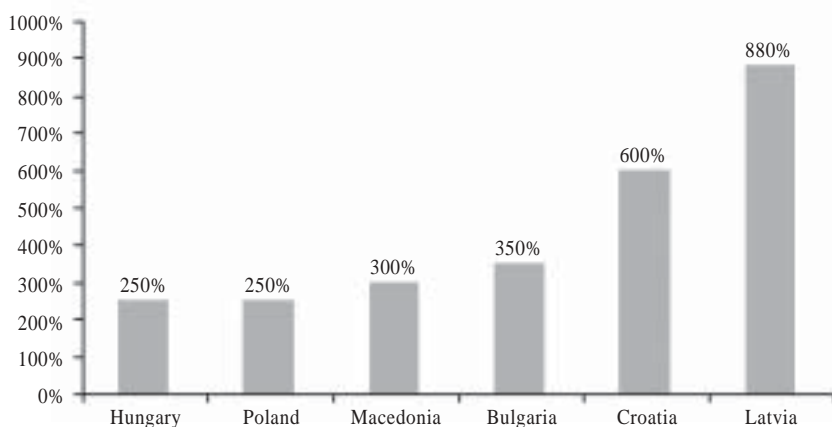
Contributions to funded tier	Contribution level by country	
Set at final level, fully deducted from previous mandatory contribution	Kazakhstan	10%
	Poland	7.3%
	Macedonia	7%
	Croatia	5%
Gradually increasing, fully deducted from previous mandatory contribution	Hungary	6% → 8%
	Latvia	2% → 9%
	Bulgaria	2% → 5%
Set at final level, partially at a cost of increased contribution for workers	Estonia	4% + 2%

Source: country sources and FIAP survey

of 200 BGN (73% of average wage) and for farmers either 50 BGN (for those that do not have any other occupation) or 100 BGN (for those that do have some other occupation)<sup>7</sup>. In Poland, the minimum level of contributions is indirectly specified for employees, as it cannot be lower than the minimum wage in the economy<sup>8</sup>. In the case of the self-employed, the declared income for social security purposes cannot be lower than 60 per cent of average wage. In practice, a majority of the self-employed (more than 95 per cent) declare the minimum level.

The ceiling is established in six countries, while in two (Estonia and Kazakhstan) there are no ceilings on contributions (Figure N° 6). Interestingly, the level of ceiling varies significantly, from 250% of average wage in Hungary and Poland to 880% of average wage in Latvia. The latter case shows that mandatory pension system is still perceived as the predominant source of retirement income for large groups of the population, which is less so in the former countries.

**Figure N° 6**  
**CEILINGS ON CONTRIBUTIONS**



Note: In Hungary, the ceiling applies only to the employee part of the contribution

Source: own calculations based on country sources and FIAP survey

<sup>7</sup> For comparison, the average wage in Bulgaria by the end of 2002 was estimated at the level of around 280 BLN (according to the Bulgarian Statistical Institute). The annual exchange rate of the BGN against USD was 2.08.

<sup>8</sup> From January 2003 the minimum wage is equal to 800 PLN. According to the legislation, the Tripartite Committee sets the level of minimum wage annually.

### 2.3. Changes in the pay-as-you-go systems

Because contributions to the pay-as-you-go system were reduced due to the creation of funded pensions, changes in the pay-as-you-go pillars were necessary. The design of reformed systems should lead to reinstating financial stability of the systems in the long run. It usually means necessary reductions of expenditures. Lindeman, Rutkowski and Sluchynsky (2000) list three basic reasons for such reductions:

- (a) reductions necessary to obtain balanced pay-as-you-go promises;
- (b) reductions necessary to obtain balanced pay-as-you-go with funded pillar offset;
- (c) additional reductions to finance transition costs.

Such reductions are made by increasing retirement ages, lowering pension indexation and reducing the benefit level in the pay-as-you-go system.

In all of the countries, retirement ages were increased, reflecting the need to increase the activity rates of the working-age population. Despite these increases, in most of the countries the retirement age is still below the developed countries standard of 65 years. It means that the system dependency ratios will still be higher than demographic dependency ratios, resulting in a higher burden on the working population. Additionally, lower retirement ages under a defined-contributions scheme would mean lower annuities, which may reduce total pension provision for the funded tier participants. This issue is especially problematic in countries that kept the gender differential in retirement ages.

Indexation of pensions in all of the countries is kept below growth of wages, usually using a mixed index, taking into account both price and wage inflation. As a result, the growth of pension expenditure is lower than the growth of wages, which reduces the deficit.

As far as the pay-as-you-go benefits design is concerned, analysis of the country cases shows two approaches to such changes:

- a relative reduction of the size of the pay-as-you-go pillar to reflect lower contribution;
- a reform of the pay-as-you-go pillar, changing its rationale.

In the case of Kazakhstan, the old system was discontinued, as the new funded system substituted the old one based on the pay-as-you-go principle.

The changes apply to pension rights accrued after the introduction of the multi-pillar schemes. All pension rights accrued before the reforms were fully recognised.

### *2.3.1. Changes in the pay-as-you-go systems*

Most of the countries retained their defined-benefit pay-as-you-go systems, modified to reflect lower pension provision. Such an approach was taken by Hungary, Macedonia, Bulgaria and Estonia.

In Bulgaria and Estonia, accrual rates have been reduced proportionally to the relative share of funded pillar contribution. The changes in Hungary and Macedonia are more complicated. In particular, older workers have a relatively higher pension promise, if they do not switch.

This comparison shows that there was a common concern to limit participation in the funded system for older workers, explicitly or implicitly, since given the relatively short period of their potential pension savings, their potential payments from the funded scheme would be small. In Bulgaria and Estonia older workers were not allowed to participate in the funded pillar, thus reduction of accrual rates was simpler. Hungary and Macedonia did not establish an age limit for the participation in the funded pillar but the design of the pension formula provided disincentives for the older workers to participate in the funded system.

Latvia and Poland replaced their traditional defined-benefit systems with notional defined contribution ones. In such systems, all participants have individual accounts on which notional capital is accumulated. There is a direct link between contribution payments and benefits. Thus, no additional rules regarding the pension level for switchers or non-switchers were necessary. Such adjustment was made automatically by a lower level of contributions, diverted to notional accounts. Poland and Latvia also limited the participation in the funded system to younger cohorts.

### *2.3.2. Pension rights before multi-pillar introduction*

The past pension rights accrued in the pre-reformed systems are valued and paid from the existing pay-as-you-go schemes in all the

countries (rather than the recognition bond approach taken for example in Chile). The way the accrued rights are recognised depends on the type of the pay-as-you-go system after the reform.

In Hungary, Croatia, Macedonia, Bulgaria and Estonia, pension formulas include pre-reform accrual rates for service before reform introduction and post-reform accrual rates after the change. As a result, the relative size of the pay-as-you-go part is higher for older workers.

A similar effect was achieved in Poland and Latvia. However, the rights accrued in the pre-reform systems were re-calculated as initial capital, which was registered in notional accounts.

In the case of Poland, initial capital reflects pension rights accrued prior to 1999. This approach, however, is relatively complex, as employees and employers needed to provide information regarding past service and insured income necessary to calculate pension (dating even up to 30 years back). Sometimes necessary data did not exist or was quite difficult to find. The law obliges employers to send required information to ZUS by the end of 2003. This would enable ZUS to calculate initial capital before persons covered by the new system reach retirement age. Latvia chose a simpler approach. Initial capital reflects the value of hypothetical contributions that persons would have paid, based on years of service before 1996 and the monthly average contribution wage in 1996-1999.

In Kazakhstan, all pension rights accrued before 1998 will be paid according to the old rules, which means that all persons who worked before reform introduction will still be eligible to a part of a pay-as-you-go pension. Pension rights were frozen at the moment of the reform implementation. In the remaining countries a part of benefit that reflects working prior to the reform introduction is calculated using pre-reform accrual rates.

Neither of the changes shown above has an immediate effect on expenditure. Hence, upon introduction of a funded pillar, some transition costs need to be financed from public sources, either from current revenues or using debt instruments. The size of transition costs depends on policy choices that include contribution level and cohorts covered by the new regulations. It is also affected by individual choices regarding participation in the funded pillar (if it is optional for some categories of workers).

In a few countries, some of the costs of transition were financed using extraordinary budget revenues. In Poland privatisation proceeds were used to cover the transition. Also in Kazakhstan, funds from oil reserve are partially used to cover current pension expenditure.

While reforming their pension systems, most of the countries retained the leading role of the pay-as-you-go pillar. Thus, it was necessary to maintain or regain social confidence in them. This confidence was sometimes sought by referring to the examples of other countries that are well perceived in the society. Poland and Latvia used the example of Sweden performing the shift of paradigm within the public pillar from defined benefit to defined contribution. Croatia applied changes referring to the example of Germany.

## **2.4. Voluntary pensions schemes**

Voluntary pension plans in four countries (Hungary, Bulgaria, Estonia and Latvia) were created prior to the development of the mandatory funded pillars. Out of these countries, voluntary systems are most highly-developed in Hungary and Bulgaria - in both these countries they have operated since 1994. By 2000, participants of these schemes amounted to over 1 million persons in Hungary (with assets of 1.4% of GDP), and over 400 thousand persons in Bulgaria (with assets of 0.4% of GDP).

In Hungary, third pillar funds allow individuals to supplement their pension savings. There is some tax credit, as 30% of contribution is deductible from the tax payable. The institutional framework is broadly similar to the one of the second pillar, though in this case private individuals can also set up funds. There is no explicit government guarantee.

In Estonia, a supplementary pension plan was introduced in 1998. By the end of 2000, the number of participants was low, covering less than 1% of the employed population. There were also few pension plan providers. At the end of 2000, only six life insurance companies operated in Estonia, with approximately 10 thousand members. There was only one pension fund with 150 unit holders. Accumulated assets represented less than 1% of the GDP.

In 2001 there were three voluntary pension funds in Latvia, one of them employer-based (for the Latvian Telecom). Development of



voluntary pensions was hindered by the Russian crisis. Also the rules for private pension funds were quite restrictive. Pension assets amounted to 0.13% of the GDP.

Other countries implemented third pillar legislation together with mandatory funded schemes. Thus, there are little experiences in Croatia and Macedonia. In Kazakhstan, voluntary savings are allowed within the framework of the pension fund. Very few people decided to save additional amounts.

In Poland separate occupational pension plans can be established. At the end of 2002, there were more than 180 occupational pension plans registered. As far as membership, less than 1% of workforce participated in such plans.

Currently the voluntary schemes in most of the countries are not very popular, as workers were used to relying on mandatory systems for their pension provisions. Pension reforms can change this perspective and encourage more pension savings in the future.

## **2.5. Coverage of the multi-pillar systems**

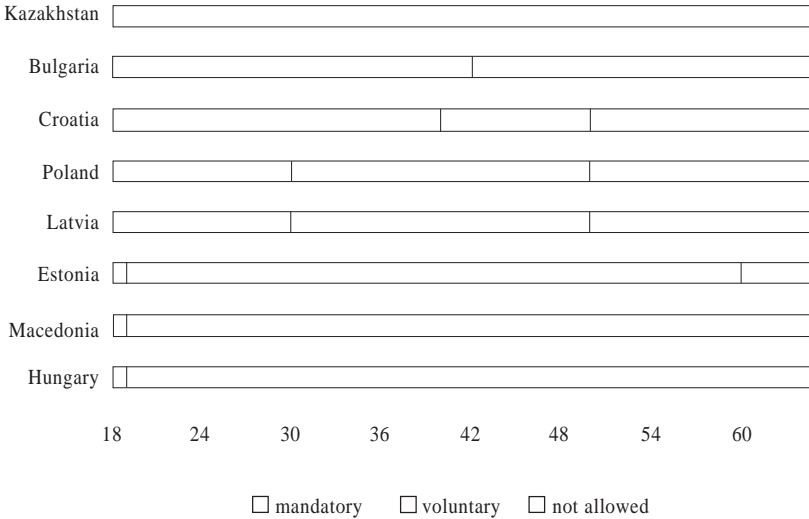
In all the countries, participation in the second pillar funded scheme is mandatory for new workers<sup>9</sup>. As far as current workers are concerned, there are various patterns chosen by each country. In Poland, Latvia, Estonia and Croatia, workers within specified age brackets were given an option to choose whether to be in the funded scheme or not. In Kazakhstan the new funded scheme is mandated for all workers and in Bulgaria for those who were younger than 42. In Hungary and Macedonia, all current workers had a choice to participate in the funded pillar. In all the cases, the decision to switch to the funded scheme is irrevocable.

As a result of these policy choices, the transition period will be different in all countries. The fastest transition is of course in the case of Kazakhstan, where all workers are automatically in the new scheme. Countries that also have a relatively fast transition are Croatia and Bulgaria. In Hungary, Estonia and Macedonia it will take the longest time for all insured to be in the funded scheme.

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<sup>9</sup> In case of Hungary, in 2002 the participation in funded scheme was not mandatory, starting from 2003 it is mandatory again.

**Figure N° 7**  
**MANDATORY AND VOLUNTARY**  
**PARTICIPATION IN FUNDED PILLAR**



Source: own calculations based on country sources and FIAP survey

In the case of the six countries that allowed for voluntary switching (Hungary, Poland, Croatia, Latvia, Estonia and Macedonia) it is also important to note the length of the period during which the switch had to take place.

In Hungary, workers had 20 months (from January 1998 to the end of August 1999) to make their choice. In Poland, this period was half that long (from March 1999 to the end of December 1999). In Croatia, it was even shorter and limited to 6 months (from January to June 2002). In Estonia, the time horizon to make a choice depended on the age of a worker. For the oldest workers who were given a choice (born between 1942 and 1956), the time to decide was shortest (6 months - from April to the end of October 2002). Those born between 1957 and 1961 have to decide before November 1, 2003. Then, for each cohort, the time to make a choice is extended by one year. In Macedonia, current workers have one year to decide whether to switch (in the course of 2003). The actual split of all contributions will start from January 2004.

There are two basic approaches that emerge from this comparison. Most of the countries decided to limit the participation in the funded scheme to certain age cohorts. This approach makes it possible to avoid the problem of “mis-switching” people who would save for a relatively short time. Another approach, taken for example in Hungary, resulted from a legal system that did not allow any restrictions on participation. However, the reform there included significant disincentives to switch for older workers. The predominant practice is to limit the switching for persons younger than 50 years of age. At the other end of the scale, younger workers are usually obliged to participate in the funded pillar and some groups are offered a choice. This allows for gradual implementation of the new system. Additionally, it allows for limitation of transition costs, because in the first decades of reform implementation, the number of covered workers increases gradually.

### **3. DESIGN OF THE NEW FUNDED SCHEME**

The design of the funded pillar specified in the legislation reflects the specific situation in the country as well as international experiences that were used for the design of particular solutions. As a result, each of the countries developed unique structures. This chapter aims to present the design of pension systems, looking at both similarities and differences resulting from the choices that were made. The comparison takes into account, among others, the general legal framework under which pension funds operate, the requirements necessary to establish new funds, sales and marketing regulations, as well as investment regulations, guarantees and tax rules applied.

#### **3.1. Legal structure**

In most of the cases, pension funds and pension fund managing companies are private institutions. The law defines who can manage or who can be a shareholder of the company managing pension funds. In general, the managers of pension funds are private institutions that operate according to the rules of the commercial law. Public institutions are allowed to manage funds in Kazakhstan and in Latvia. In Kazakhstan, there are several private non-state pension funds and one state public pension fund. In Latvia, until January 2003, the sole 2<sup>nd</sup> pillar asset manager was the State Treasury, which has authorisation to invest assets in

Latvian State securities, term deposits with the banks, mortgages and deposit certificates. From January 2003, participants of the state funded pension scheme can choose specially licensed investment companies that act as private asset managers, offering a broader scale of financial instruments.

As regards the form of operations and possible owners of pension funds and pension fund managers, there is a wide range of options exercised among countries.

*The required legal form* of the pension fund managers is predominantly that of a joint-stock company. The legal form usually depends on the historical development and existing practices. In Croatia and Estonia it can also be a public limited company. In Hungary, they operate as mutual foundations, as voluntary pension funds established prior to 1998, where pension funds are independent legal entities owned by their members. In Croatia, pension funds are not legal entities but property with a special status owned by participants. In all of the analysed countries, activities of pension fund managers are limited only to the management of pension funds.

*Shareholders or founders* of pension funds or pension fund managers can be either legal or physical persons. Most of the countries do not limit the types of shareholders. Such limitations exist in Hungary, where employers can found pension funds, chambers of trade, professional associations, employees' interest organisations or local governments. Founders can establish pension funds separately or jointly. Also in Latvia, the founders (shareholders) of an open pension fund may only be: (i) a bank permitted to accept deposits of individuals pursuant to the procedure prescribed by the Bank of Latvia or (ii) a life insurance company registered in the Republic of Latvia. The founders (shareholders) of a closed pension fund may only be those employers who have entered into a collective contract of affiliation regarding their employees with the pension fund. In Macedonia, only legal persons can be shareholders of pension funds.

In some cases, there are limitations on the percentage of share capital that can be owned by one shareholder. In Kazakhstan one entity cannot have more than 25 per cent of voting shares, without the consent of the Supervision Authority. Enterprises that have the state as shareholder cannot be shareholders of non-state pension funds without permission from Supervision. In Poland, the law

specifies the level of share capital owned that requires the consent of Supervision. In Macedonia, founders which would hold 51 per cent or more share capital of a pension company must be banks, insurance companies, pension companies and other licensed financial institutions or entities which, directly or indirectly, hold more than 50% of the shares of such institutions.

In Poland one entity can be a shareholder in only one pension fund managing company (PTE). In Croatia any transaction on the stocks of the management company requires the consent of Supervision. Similarly as in Poland, the law does not allow one company to be a shareholder in more than one managing company.

Regarding *business limitations*, pension fund managing companies can only perform activities related to their core business. In some of the countries the law also limits the number of funds that can be managed by one manager. Generally, in Poland, Croatia and Macedonia, the law currently allows a pension fund managing company to manage only one fund. Managing more than one fund can only be a result of a merger or acquisition process, on a temporary basis. In Poland, PTEs will be allowed to manage two funds starting from 2004 and in Macedonia, this will happen after 10 years of implementation. In Kazakhstan, a pension fund manager must obtain consent from Supervision to manage more than one fund. In Bulgaria, pension fund managers are allowed to manage up to three types of funds: universal, occupational<sup>10</sup> and voluntary. There is no regulation on this issue in Hungary and Latvia. In Latvia, second tier managers can provide multiple investment plans. Additionally, only Hungary allows the establishing of closed funds; in other countries, only open funds are allowed.

The law also regulates the services that can be provided by managing companies and those that can be contracted out. In Hungary, pension funds are authorised to provide administration, record-keeping, actuarial tasks and asset management. In Poland, record-keeping can be contracted out to a transfer agents, while administration and asset management must be done in house. In Bulgaria, managing

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<sup>10</sup> These funds are mandatory and cover the savings for early retirement for persons working in hard or hazardous conditions of work until they reach the retirement age. Members of these funds can be simultaneously members of universal pension funds. The two types of funds are separate and persons cannot switch between the two, as they cover different risks.

companies are also allowed to pay annuities, lump-sums or fixed term payments of the amounts accrued at their accounts.

The legislation in all countries limits the possibility of using the words “pension fund” only to pension funds operating according to the legislation. No other companies are allowed to use such names, while in some of the countries (for example Hungary), pension funds are obliged to use it.

### **3.2. Licensing**

In all the countries, pension fund managers and pension funds require a licence before starting their operations. Licensing criteria and procedures vary among countries. Generally, several types of requirements exist in country regulations.

Pension fund managers in all of the countries need to fulfil various criteria specified in the legislation. The law in each of the countries also requires the potential pension fund managers to present draft statutes and articles of association, financial and business plans. Additionally, future board members and investment advisors need to prove their experience and qualifications<sup>11</sup>.

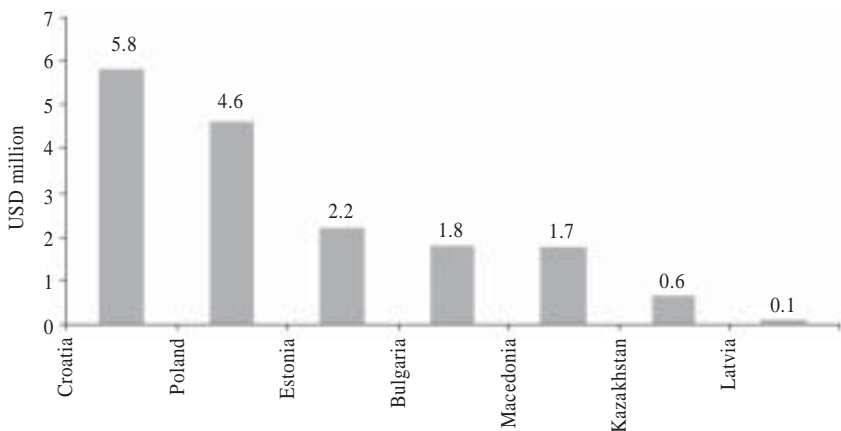
In the majority of countries there is a requirement for minimum capital to establish a pension fund. The only country that does not have this requirement is Hungary (due to the different legal form of a fund). The size of the minimum required capital differs significantly among countries, which is illustrated in Figure N° 8. Croatia has the highest required capital, Poland ranks second. This high requirement may be related to the minimum rate-of-return guarantees and resulting financial responsibility of the managing company. In other countries, the minimum capital is significantly smaller.

There are minimum membership requirements established in Hungary and Croatia. In Hungary, a pension fund must have at least 25 thousand members if it pays annuities itself or at least 2 thousand members if it buys annuities from an insurance company. In Croatia, a pension fund should have not less than 80 thousand members. As a result, there is an implicit limit on the number of possible pension funds. In Macedonia, that limit is explicit, as

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<sup>11</sup> Detailed requirements for each country are presented in the annex.

**Figure N° 8**  
**MINIMUM CAPITAL REQUIREMENT**



Source: own calculations based on country sources and FIAP survey

only two managers selected by international tender are allowed. In the remaining countries, there are no limitations on the number of operating pension funds.

There are also specific licensing procedures. For example in Hungary, licensing of mandatory pension funds consists of three steps. Firstly, the founder applies to the Hungarian Financial Supervision Authority (HFSA) for a foundation permit. Application should include the draft deed of the foundation, membership estimates, a description how the founder intends to ensure the necessary personal, physical and financial resources, and the deed of foundation of the founder. Secondly, within 30 days of its foundation, the pension fund must submit an application for registration to the county court of territorial jurisdiction. The court must take the final decision within 15 days. The foundation permit is valid for 180 days in which the fund must, as a third step in the licensing process, apply to the HFSA for an operating license. The HFSA may require the modification of any submitted document and must take the final decision within 60 days. The pension fund may operate on a limited scale before the operating license is granted. The fund must be also registered at the county court of the territorial jurisdiction. The application for this must be submitted within 30 days after the foundation.

In Poland, PTEs first apply for a license to establish a PTE and a promise to get a license for establishing a pension fund. As a second step, after the establishment of the PTE, the license for the establishment of a pension fund is granted.

### **3.3. Sales and marketing**

As described in the previous section, upon implementation of the new system, a significant proportion of insured people need to decide on their participation in a pension fund in a relatively short period of time. As a result, marketing and sales activities during the first years of operations are particularly intensive<sup>12</sup>. As the decision to join the funded scheme is irrevocable, some countries choose to introduce specific legislation aimed at assuring proper standards of sales and marketing. The legislative regulations can, among others:

- (i) set the rules that a contract between a member and a pension fund should follow;
- (ii) establish rules of marketing (i.e. limiting joint sales of several products from the group);
- (iii) establish rules of sales (i.e. limiting sales at certain places or under specified conditions);

Generally, there are two approaches that emerged. In Hungary, Kazakhstan and Estonia the rules of marketing and sales are relatively simple. For example in Hungary, the law forbids offering maintenance commissions to agents. In Kazakhstan, the law enumerates elements that should be included in the contract with the pension fund. Pension fund managers have to get their contract formats approved by Supervision. In Latvia and Estonia, words which would misleadingly give reason to believe that a pension fund has a different profile, for example, should not be used in the name of the pension fund.

Other countries have more complex rules regarding sales and marketing of pension funds. As far as sales, the law in Poland, Croatia, Bulgaria and Macedonia does not allow for offering any additional benefits for joining or transferring to a pension fund, except for advertising materials of insignificant value. Similarly,

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<sup>12</sup> For detailed discussion of country case, see for example Chlon (2000).



all marketing materials should be fair and no false or misleading statements or promises are allowed. The supervisory agencies issue guidelines regarding marketing. In Croatia and Macedonia, all marketing materials must be approved by Supervision before being disclosed and broadcast.

The law in Poland, Croatia and Macedonia also limits sales possibilities in certain places. In Poland, employers or persons in a position of authority at work cannot be sales agents for their employees. In Croatia, employers and trade unions are prohibited from participating in advertising mandatory funds. In Macedonia, no marketing of a pension fund can be conducted at the workplace. No person in a position of authority at work relative to another person may market a pension fund to that person.

Sales agents in Poland and Macedonia have to be registered with the supervisory authority. They should not have been convicted by a court and should fulfil all legal obligations. In Poland there are also restrictions regarding contracts between sales agents and pension funds. Sales can be done only by employees of pension funds, banks, insurance companies and insurance agents, brokerage houses. An agent can only act for one fund and if they change the fund for which they work it must be re-registered in Supervision. A similar regulation is also in force in Macedonia. Additionally, in Macedonia, there is a check of professional qualifications by the Supervisory Agency.

In general, pension funds can use other networks to distribute their services, but this is not allowed in Croatia.

### **3.4. Rules regarding transfers between providers**

In all the countries, the choice of pension fund is a decision for the individual. But there are limitations regarding transfers between providers. These limitations are designed to reduce the frequency of transfers and, in that way, keep the costs low. Frequent transfers imply high costs that should be avoided. There are indirect regulations limiting transfers, in the form of regulating sales and marketing<sup>13</sup> - by limiting joint sales or prohibiting extra benefits. There are also direct regulations that take two forms:

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<sup>13</sup> These rules are described in section 3.6

- (i) administrative limits on frequency of transfers;
- (ii) special fees in case of early transfers.

Three countries (Hungary, Bulgaria and Macedonia) have both types of regulations. Kazakhstan, Latvia and Estonia have only limits on frequency of transfers. Poland and Croatia do not limit the number of transfers, but they impose a transfer fee.

The limits usually allow members to switch between funds once or twice a year. The maximum size of transfer fees differs between countries. In Bulgaria, the fee covers the actual cost of transfer between funds. In Poland, the maximum fee is specified in relation to minimum wage and does not depend on the total assets of a member (from 40 to 5 per cent of minimum wage). In Hungary and Croatia, the size of transfer fee depends on the size of pension savings. The limit on that fee is relatively low in Hungary (at 0.1 per cent), while it is quite high in Croatia, especially for switching in the first year of affiliation (5 per cent of total accumulation).

**Table N° 5**  
**LIMITATIONS ON TRANSFERS BETWEEN PROVIDERS**

Country	Legal restrictions	Penalty fees
Hungary	✓	✓
Kazakhstan	✓	
Poland		✓
Latvia	✓	
Croatia		✓
Bulgaria	✓	✓
Macedonia	✓	✓
Estonia	✓	

Source: country sources and FIAP survey

### 3.5. Contribution collection mechanism

In four countries (Hungary, Poland, Latvia and Bulgaria) contributions are paid by employers and employees. In Estonia, employees pay contributions if they participate in the funded

pillar. In other cases, contributions are fully financed by employers. In the remaining countries the entire contribution is financed by employers. In all the cases, employers transfer the contribution to collecting agencies, withholding the appropriate part of contribution from their employees' salary, where applicable.

There are several choices for collection mechanism. The first one is whether employers should pay contributions directly to pension fund (de-centralised collection), or there should be one institution that collects contributions and then transfers them to selected pension funds (centralised collection). The choice between these two options should be made, taking two issues into account.

*Employers' burden.* In systems where the choice of a fund is based on employers' decisions, such as most of the occupational schemes, sending contributions directly to pension funds seems the simplest option. However, if the decision is made by individuals, employers can be burdened with sending separate contribution to several (and sometimes more than ten) pension funds, which can be difficult administratively (for example, each of the funds may require a different format of information) and expensive (employers have to pay per each money transfer). Thus, creating a unified central collection mechanism might be easier from the employers' perspective.

*Information.* In schemes where individuals decide on pension funds (and these are the schemes discussed in the paper), de-centralised contribution collection also means that employers have to know to which fund their employee belongs. As a result, they might be tempted to influence the employee decision. In the centralised systems, employers do not have to know about employees' fund affiliation.

Among the analysed countries, seven out of eight decided to have centralised collection, while only one –Hungary– decided on the de-centralised option. Under the centralised approach, either existing or new institutions collect contributions. The choice between these options depends on the capacity of existing institutions to collect money and process the information necessary to transfer individual contributions to pension funds. If such capacity is not sufficient and cannot be strengthened, a separate institution may be established.

**Table N° 6**  
**TYPES OF CONTRIBUTION COLLECTION**  
**IN THE ECA COUNTRIES**

Country	Decentralised	Centralised			Fee for collection
		Separate institution	Social Security Administrator	Unified collection with tax	
Hungary	✓				
Kazakhstan		✓			
Poland			✓		✓
Latvia				✓	
Croatia		✓			
Bulgaria			✓(until 2003)	✓(from 2004)	✓
Estonia				✓	
Macedonia			✓		✓

Source: country sources and FIAP survey

In Kazakhstan, the collection is done by SPPC - State Pension Payment Centre. The SPPS collects contributions for the funded scheme and transfers them to the appropriate pension funds. It also maintains individual records of contribution history, which may serve as back-up information in case the pension funds' information system fails. The SPPS is publicly financed and managed and does not charge the pension funds any fee for its services.

In Croatia contributions to the pay-as-you-go system are collected and enforced by the Tax Department in the Ministry of Finance, whereas contributions to individual accounts in the funded pillar are collected by REGOS, Central Registry of Affiliates. REGOS forwards contributions to the respective individual accounts. Enforcement, however, is done by the Tax Department, upon request by REGOS. Similarly as in Kazakhstan, REGOS does not charge pension funds for its services.

In Poland, contributions for all social security purposes are collected by ZUS<sup>14</sup> (Social Security Administration). ZUS is also responsible for enforcement. ZUS keeps the registry of insured and pension

<sup>14</sup> ZUS collects also contributions for the Labour Fund and Employee Benefits Guarantee Fund and health care insurance.

fund affiliates. Each month, employers send individual reports on the contributions due for their employees. Based on this information, the appropriate amount of contribution is transferred monthly to pension funds. According to the social security system law, ZUS has 15 days to perform this operation. If the employer does not pay, contributions are enforced. PTEs pay ZUS a collection fee, that cannot exceed 0.8 per cent of transferred contributions (currently ZUS charges a maximum value for this fee).

In Bulgaria, the NSSI (National Social Security Institute) collects all mandatory contributions, including the ones to the private pension funds. As of 2004 the United Revenue Agency will perform this activity. The fee retained for the collections equals 0.8 per cent of transferred contributions.

In Macedonia, the Public Pension and Disability Insurance Fund of Macedonia has to collect all the contributions and, for 2<sup>nd</sup> pillar members, send the appropriate amount to the chosen pension fund. The managers pay a fee that cannot exceed 1.2 per cent of transferred contributions in a given year.

In Latvia, the State Revenue Service collects all social insurance contributions. Out of this amount, the funded pillar part is sent to the Latvian Central Depository. The Depository is authorised to operate the accounts of the state funded pension scheme's participants in the period of 2003-2006. It will keep records of the state funded pension scheme's participants, ensure transfer of contribution to fund managers as well as register change of fund managers and investment plans.

In Estonia, the Estonian Tax Board collects all taxes and contributions. In addition to the employer's contributions, the employer transfers the 2 per cent withheld from the employee's salary to the Tax Board. The Tax Board adds the 4 per cent of social tax and transfers the total amount to the Estonian Central Depository for Securities in the Bank of Estonia (CSD). CSD calculates the number of pension fund units corresponding to the received amount in the personal pension account and transfers the money to the chosen pension fund. Pension funds do not pay any fee for contribution collection.

The predominant approach in the ECA region is to use public central collectors to collect contributions to funded pillars. This

role is usually played by institutions already experienced in this field (social security administrations or tax offices). Only in two cases - Kazakhstan and Croatia - new institutions for collections were established. This approach seems to draw from past experiences. In most of the countries, collecting institutions were performing quite well in the past. Thus, there was no need to change existing practices. Additionally, in most of the cases, collections are done free of charge, which reduces the costs for pension funds and consequently, the possible level of charges. In this way, the government also keeps control on the compliance level in both public and private tiers.

Individual contribution collection brings new challenges for the administration. Sometimes this challenge can be underestimated and problems may emerge, resulting in significant portions of contributions that are not reconciled.

### **3.6. Charge structure and limits**

Charge structure is an important element of the system design. All the countries limit the types of fees that can be charged by pension fund managers. The most frequent types are fees deducted from contributions and fees deducted from assets. In some cases fees based on the investment return and other fees that can be attributed to pension funds' operations are allowed<sup>15</sup>.

Countries also impose limits on charges. In the mandatory schemes these can be treated as a way of protecting the member's interest from pension fund costs that are too high. Introduction of charge limits can be important from a political perspective, especially at the initial stage of pension reform. With time, as systems mature, these limits can be relaxed<sup>16</sup>. Charge strategies are summarised in Table N° 7.

All countries except Hungary allow pension fund managers to charge a fee deducted from contributions. In Hungary, another type of fee - an admission fee - can be charged. In five countries this fee

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<sup>15</sup> Additionally there are transfer fees that can be charged for early transfers, which are discussed in section 3.4.

<sup>16</sup> Poland gives a contrary example, as in 2003 Polish government proposed an amendment to the law on organisation and functioning of pension funds, aimed at imposing more strict regulation on the charges.

**Table N° 7**  
**APPROACHES TO PENSION INDUSTRY**  
**STRUCTURE OF CHARGES**

Country	Limits on charge structure	Admission fee	<i>Types of charges</i>		Performance from investment return
			Contribution-based fee	Asset management fee	
Hungary	✓	-	x	✓	x
Kazakhstan	✓	x	-	x	-
Poland	✓	x	✓	-	x
Latvia	✓	x	-	-1	-
Croatia	✓	x	-	✓	x
Bulgaria	✓	x	-	-	x
Estonia	✓	x	-	-	x
Macedonia	✓	x	✓	-	x

Note: types of charges: ✓ allowed without limits; - allowed with limits; x not allowed.

<sup>1</sup> Until 2003 fee covered from state budget

Source: country sources and FIAP survey

is limited by the law, and the limit ranges from 0.8% in Croatia to 5% in Macedonia. All countries except Kazakhstan allow pension fund managers to charge a fee deducted from assets. In five countries (excluding Hungary and Latvia), the law also limits this fee. The limit ranges from 0.6% of assets annually in Poland<sup>17</sup> and Macedonia to 2% of assets in Estonia. In Kazakhstan and Croatia another fee - based on the investment return - can be charged. In Croatia a success fee up to 25% of net investment return can be charged, while in Kazakhstan a fee up to 10% of investment income can be deducted. A performance fee of up to 0.06% of assets will be also charged annually in Poland, as from 2004.

On the top of the abovementioned fees, in Hungary and Poland the law allows custodian fees and operational fees to be deducted from the funds' assets (to cover costs of market operations). In Poland, the size of all these fees must be included in the fund's articles of association that are approved by the Supervision. No charge above the level specified in the articles of association can be charged to

<sup>17</sup> The amendment to the law, proposed by the Polish government in 2003 imposes a 3.5% limit on the contribution fee (effective from 2013). It also reduces the management fee, with limit dependant on the size of assets. Additionally, a small performance fee (up to 6 basis points annually) is proposed.

the pension fund member. If charges are higher, the outstanding amount is financed by the pension fund manager. In Estonia, the fee for the custodian is also deducted from members' assets, while in Macedonia the same is applied to brokerage fees. In Bulgaria, an information fee for those demanding information more than once a year is allowed<sup>18</sup>.

Some countries allow differentiating fees among members. In Hungary, there is no specific regulation on this subject. Poland and Macedonia allow reduction of the fees for those that participate in the fund for a longer period of time. Differentiating is also allowed in Croatia.

### **3.7. Supervisory structure and staff**

Pension funds' supervision can be established as a separate body or be consolidated with other elements of financial market supervision. Both of the arrangements exist in the analysed countries. The most frequent solution (applied in four countries) is fully consolidated supervision. In two countries, the supervision is partially consolidated, while in two - it is separate for the funded pension system (see: Figure N° 9). Taking stock of the countries, the structure of supervision evolved over time is moving towards larger consolidation. In 2000 the Hungarian Financial Supervision Authority emerged, integrating the entire financial market supervision. In 2002 in Poland pension fund supervision was merged with insurance supervision. Also in Kazakhstan supervision was partially consolidated after the implementation of the reform.

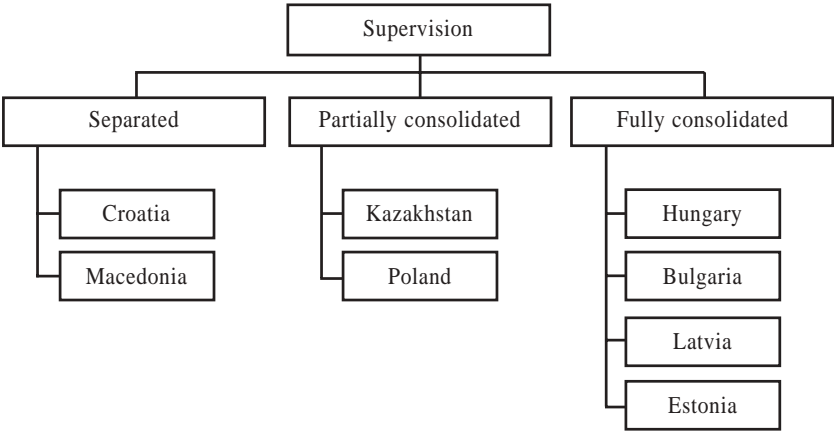
In Croatia, the Agency for Supervision of Pension Funds and Pension Insurance (HAGENA) is responsible for supervising both the accumulation and payout stage of mandatory and voluntary pension systems. The Director of HAGENA is nominated by the Government and appointed by the Parliament for a mandate of 7 years. The Parliament has a right to remove the Director, based on the government's proposal or independently. A Deputy Director and two Assistance Directors are appointed and removed by the Parliament and nominated by the Director.

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<sup>18</sup> However, no company collects this fee at the moment.



**Figure N° 9**  
**PENSION FUNDS SUPERVISION STRUCTURE**



Source: country sources and FIAP survey.

In Macedonia, the supervision of the funded pillar will be done by the Agency supervising the fully-funded pension insurance. The Chairman of the Agency is appointed and removed by the Government. The Minister of Labour and Social Policy presents the candidate. The Chairman should be a Macedonian citizen, have a university degree related to the required experience (economics, finance, accounting, investment, insurance, actuarial science or law), at least 6 years of experience in the abovementioned fields, including a management or supervisory position for at least 4 years. There should be no security measure affecting him/her that prohibits the exercise of his/her profession, activity or duty. Removal is only possible under limited circumstances, described in the law.

In Kazakhstan, initially, there were three government entities responsible for regulating the pension system: the National Securities Commission, supervising the asset management companies, the Committee for Regulation of Pension Funds, supervising the pension funds (and reporting to the Ministry of Labour and Social Policy) and the National Bank of Kazakhstan, supervising the custodian banks. Such supervision structure was related to the fact that establishment of the new, separate, supervisory agency would have been difficult in the country with

limited regulatory experience. In 2001, the functions of the two former institutions were transferred to the Department for Securities and Market Regulation of the National Bank of Kazakhstan. The government is considering the creation of the independent agency, based on this department.

In Poland from 2002, pension funds are regulated by the Committee for Supervision of Insurance and Pension Funds (KNUiFE). The President, who is appointed for a 5-year term, manages KNUiFE. The Minister of Economy, Labour and Social Policy and the Minister of Finance each appoint a deputy president. Two members of the Committee are appointed by the President of the Securities Commission and by the President of the Office for Protection of Competition and Consumers. Representatives of the Insured Ombudsman, the President of the Republic of Poland and General Banking Inspectorate participate in the Committee meetings, without a right to vote. KNUiFE is responsible for protecting the interest of the pension funds' members, by licensing and supervising the pension funds, increasing the financial literacy of the society in the field of pension funds and employee pension plans and co-operation with other institutions regulating the financial market (Securities Commission, National Bank of Poland). Activities of KNUiFE are financed from the fees collected from supervised institutions.

In Hungary, the Hungarian Financial Supervisory Authority is regulating the funded system. HFSA is an independent legal entity. President of HFSA is nominated by the prime minister and elected by a single majority in the Parliament for a period of 6 years. The president reports to the government and has an advisory board. Activities of the HFSA are financed by supervisory fees, paid by pension funds.

In Bulgaria, the Financial Supervision Commission supervises the pension companies managing pension funds. The Commission reports to the Parliament. Members of Commission are appointed by the parliament for a period of six years.

In Latvia, the funded system is supervised by several entities, according to their competence. It includes the Finance and Capital Market Commission (which is also responsible for the voluntary system supervision), the Ministry of Finance and the Ministry of Welfare.

In Estonia, the Financial Supervision Authority is responsible for the pension funds' supervision. It oversees the activities of management companies and funds. Members of the supervisory board are appointed by the Government and the Board of the Bank of Estonia. This supervisory board appoints the management board and elects the chairman of the board. It also has power to remove members from the management board.

There is no predominating model as far as structure and responsibilities of supervision, though a trend towards more consolidated supervision may be observed. Such a situation results from the relatively short experiences of the analysed countries in financial market regulation. It can be expected that existing structures will evolve in the future, reflecting accumulated experiences. In this light, the role of supervision in the future should focus mainly on setting the standards of operations and observing whether the pension funds fulfil these standards. Additionally, the supervisors should serve the public with accurate and up-to-date information about the regulated market, helping to develop the necessary level of financial literacy among pension fund members.

### **3.8. Investment regulations**

In all the countries, specific investment regulation of pension fund assets exist. There are generally four types of limits<sup>19</sup>:

- by asset class (a ceiling on the proportion of specific asset classes in a fund's portfolio);
- by concentration of ownership (a ceiling on the proportion of the issue of a company that a given fund can hold);
- by issuer (a ceiling on the proportion of assets in a fund's portfolio issued by the same institution);
- by security (a ceiling on the proportion of individual securities in a fund's portfolio).

As far as the limits on asset class, most of the limits refer to the maximum share of assets that can be invested in given class. In the case of Kazakhstan, Croatia and Bulgaria minimum investment

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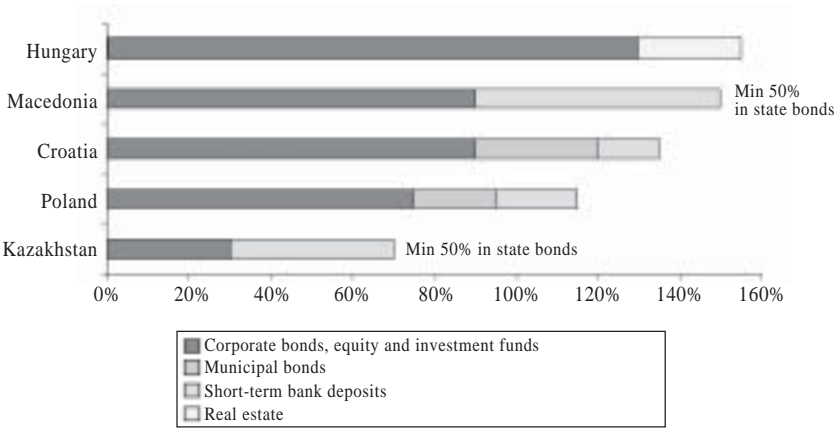
<sup>19</sup> See also Srinivas, Whitehouse and Yermo (2000). They also mention fifth type of limit - by risk. However, in the CEE countries, due to lack of experienced rating agencies, no requirements on the minimum acceptable risk rating of securities exist.

regulations also exist. In these countries not less than 50 per cent of assets must be invested in government bonds. In the case of Croatia and Kazakhstan, there are also limits on particular classes of assets. Bulgaria does not impose such limits, with exception to investment in real estate (up to 5% of assets).

Of the analysed countries, Latvia harmonised its asset investment regulations with the respective EU directive, which means that it follows prudential regulations rather than quantitative limitations. Also in Estonia there are no limits as far as investment in corporate and municipal bonds is concerned. The limit of investment in equity and in investment funds is set at 50%

Portfolio limitations for instruments other than government bonds, grouped into major categories for those countries in which restrictions are stricter, are presented in Figure N° 10. As one can observe, there are significant differences between countries.

**Figure N° 10**  
**PORTFOLIO LIMITS**



Source: country sources and FIAP survey.

In Hungary, Poland and Macedonia the sum of portfolio limits exceeds 100%, which means that it is possible, according to the law, to build an asset portfolio without investment in government bonds. The same applies in Croatia, but there is an explicit

requirement to invest in government instruments. In Kazakhstan existing limitations on investment in non-government instruments sum to below 100%, which means that not only explicit, but also implicit regulations force pension funds to invest in government equity.

Some countries prohibit investment in certain categories of assets. Investment in derivatives is not allowed in Croatia, Bulgaria and Macedonia, while in Poland and Estonia it is limited only to hedging purposes. In Poland, Croatia and Macedonia, pension funds cannot invest in real estate. The argument for such prohibition was the lack of liquidity of the real estate market.

There are also regulations that apply to specific groups of investment. In Hungary, a maximum of 60% of assets should be invested in portfolio of so-called category two<sup>20</sup>. In Poland, total investment in equity listed in the stock market, parallel and free market as well as in investment fund units should not exceed 60% of the assets of the pension fund. In Latvia, in total, investments in equity securities and investment funds that are authorised to make investments in equity securities or financial instruments of the same or higher risk category may not exceed 30 per cent of the investment plan assets.

Additional limits, on the top of those specified above may be applied in Macedonia and Estonia. In Macedonia, the supervisory agency, with the prior consent of the Ministry of Labour and Social Policy, may issue regulations providing for additional restrictions relating to investment (before the tender announcement). In Estonia, individual rules of investment are specified by funds and additional limits may be included in these rules.

Regulations regarding the concentration of ownership and single issuer are presented in Table N° 8<sup>21</sup>. All the countries have regulations regarding exposure to a single issuer, which can vary

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<sup>20</sup> This category includes: deposit accounts, bonds issued by foreign states, securities backed by Hungarian or foreign state, corporate bonds issued publicly, local government bonds, stock listed on the Budapest Stock Exchange or another recognised securities market, units issued by investment funds registered in Hungary or abroad, futures and options

<sup>21</sup> More detailed information is provided in the annex.

depending on the class of securities as well as the type of issuer. Generally, limits range from 5 to 10 per cent of assets. Only Latvia has specified limitations on the ownership structure, while such regulations can also be prepared in Macedonia. In Latvia, the restriction imposed on governments and multinational financial organisations may be exceeded if the investment plan assets include securities of six or more issues of the same issuer and the value of any particular issue of securities does not exceed 20 per cent of the investment plan assets.

Restrictions are also applied for investment in the shares of the shareholders of the managing company. Such investment is not allowed in Poland. In Latvia, investments in securities issued by commercial companies belonging to a group of companies which includes the manager of scheme assets may only be made through a stock exchange and investments in such securities may not exceed 2 per cent of the investment plan assets.

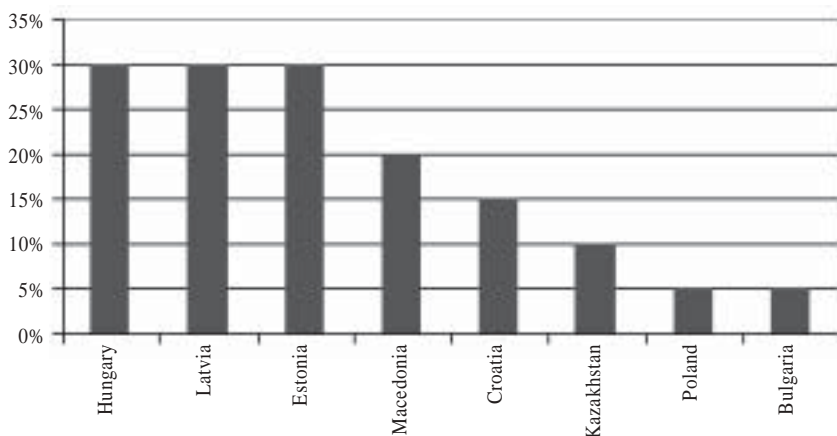
These limitations are quite strict, particularly in Poland, Bulgaria, Kazakhstan and Croatia. Pension funds are expected to hold assets representing a significant proportion of the GDP in these countries. This, combined with limited opportunities to invest on local markets, may lead to the development of a speculative bubble.

**Table N° 8**  
**LIMITS REGARDING CONCENTRATION**

Country	Single issuer	Ownership structure
Hungary	✓	
Poland	✓	
Latvia	✓	✓
Croatia	✓	
Bulgaria	✓	
Macedonia	✓	✓
Estonia	✓	

Source: country sources and FIAP survey

**Figure N° 11**  
**FOREIGN INVESTMENT LIMITS**



Source: country sources and FIAP survey

Daily valuation of assets by pension fund managers is applied in four countries (in Hungary, Poland, Latvia and Croatia). In Bulgaria and in Macedonia it is done monthly. In Estonia, semi-annual reports are required but pension funds are allowed to produce them more often. In Hungary, Poland, Latvia, Bulgaria and Macedonia, valuation of assets is done by asset managers. In Croatia valuation of assets is performed by custodian banks. In all cases, valuation is based on the market prices of assets.

### **3.9. Tax treatment of contributions, investment returns and benefits**

Whitehouse (1999) points out three transactions that constitute the process of saving via a funded pension scheme, each of which provides an occasion at which taxation is possible:

- when money is contributed to the fund;
- when investment income and capital gains accrue to the fund; and
- when retired scheme members receive benefits.

Tax treatment can be treated as an element to promote pension savings. However, given the mandatory nature of the analysed

schemes, such promotion is not necessary. The tax regimes that are developed rather take into account possible distributional effects.

Contributions are tax exempt in all the analysed countries except Estonia, where they are taxed as income (at a rate of 26%). Additionally, in Hungary a tax credit exists, namely, a quarter of individual fund contributions are tax deductible (deducted from the tax to be paid, not tax base). Investment returns are tax free in all the countries.

Most of the countries tax pension benefits. The same personal income tax rules apply to all personal income, including wages and pensions, in Kazakhstan<sup>22</sup>, Poland and Croatia. In Hungary, Latvia and Estonia - pension benefits are taxed using preferential treatment. In Hungary, only half the benefit is taxed. In Latvia the income tax for pensioners is 25% above the non-taxable minimum. The minimum itself is around five times higher than for other types of individual taxable income. In Estonia, pension benefits from first and second pillars are put together and on that level, the three times tax threshold is applied (which is currently equal to three times 1000 EEK). In Bulgaria and Hungary pensions from the funded system are tax-exempt. In Macedonia taxes are currently calculated for first pillar pensions, but not paid. For the second pillar the decision has not yet been made.

**Table N° 9**  
**TAX TREATMENT OF MANDATORY PENSION PLANS**

Country	Contributions	Pension fund	Pension payment
Hungary	C	E	E
Poland	E	E	T
Latvia	E	E	PT
Croatia	E	E	T
Bulgaria	E	E	T
Macedonia	E	E	Not yet decided
Estonia	T	E	PT

E = tax exempt, T = taxed, PT = taxed with preferences, C = tax credit  
Source: country sources and FIAP survey

<sup>22</sup> But social benefits, survivor and disability pensions are not taxed.



Slightly different solutions are applied in the case of voluntary pension plans. In most of the cases, the contributions are taxed, while benefits are tax exempt. Some tax privileges exist in Bulgaria, where employer contributions to voluntary pension plans up to 480 BGN are tax exempt. Also in Hungary a part of contribution (30%) can be deducted from the tax, up to a specified ceiling (of around 400 EUR). This may explain the development of voluntary plans in these two countries.

### 3.10. Guarantees, reserves and rates of return

Guarantees in the pension system can exist within the entire framework of the pension system, as for example a minimum pension guarantee, or within the funded pillar (for example, the minimum rate-of-return guarantee). Guarantees can be financed from various sources. For example, the minimum pension guarantee is frequently financed from the state budget or other public sources<sup>23</sup>, while the risk of meeting the minimum rate of return is usually put first on the shoulders of managing companies and their shareholders.

The guarantee system can evolve over time. This section presents a system of guarantees that was in force in 2003. Although it should be noted that in Hungary, for example, the guarantee scheme was modified several times<sup>24</sup>. Also Polish legislation was amended, leading to significant changes in the guarantee system from 2004.

The guarantee systems aim to protect the member's assets from fraud or loss of value. Some countries additionally require pension funds to achieve rates of return above a prescribed minimum, typically related to industry average<sup>25</sup>. This, however, can lead to adverse effects, such as 'herding' behaviour (Vittas, 1998 and Quieser, 1998). It also shortens the investment horizon, as pension fund managers need to meet the minimum in relatively short periods of time. In order to assure financing of the guarantees, pension funds can be obliged to build their own reserves as well as the industry reserve. There are also

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<sup>23</sup> The minimum pension guarantee is described in section 2.1.

<sup>24</sup> The modification that took place at the beginning of 2002 eliminated the minimum pension guarantee from the funded pillar and introduced the rate of return guarantee.

<sup>25</sup> For discussion on guarantees see: Srinivas, Whitehouse and Yermo (2000).

requirements to keep assets in custody. Table N° 10 presents the elements of guarantee systems including rate-of-return, reserve and custody requirements. The latter is the most popular, as all countries require pension funds assets to be kept by custodians. Mandatory reserves are less frequent, though in some countries these are replaced by high capital requirements for managing companies. The minimum rate-of-return guarantee exists in the three countries that implemented mandatory funded plans earliest, as well as in Croatia.

### 3.10.1 Rate of return requirement

In Hungary, the rate of return guarantee is related to the benchmark, which is established by the HFSA. The pension fund must make up any shortfall in individual returns if the investment performance falls below this minimum rate.

In Kazakhstan, there are two safety regulations. The first one is the explicit guarantee of the zero real rate of return. If the investment income is below the inflation level, the managing company will have to put up its capital to cover the loss. If it is insufficient, the cost is taken over by the state budget. The second one is relative to the market.

**Table N° 10**  
**GUARANTEE ELEMENTS**

Country	Minimum rate of return	Reserve on company level	Reserve on industry level	Custodian
Hungary	✓	✓	✓	✓
Kazakhstan	✓	✓		✓
Poland	✓	✓	✓	✓
Latvia		✓		✓
Croatia	✓			✓
Bulgaria		✓		✓
Macedonia				✓
Estonia		✓	✓	✓

Source: own calculations based on country sources and FIAP survey

In Kazakhstan, Poland and Croatia, the rate of return guarantee is based on the relative performance of the sector. In Kazakhstan, the minimum rate of return is calculated monthly, in Croatia –annually and in Poland– quarterly. The reference period is one year in the case of Kazakhstan and Croatia and two years in the case of Poland<sup>26</sup>.

### *3.10.2. Reserve requirements*

In six countries pension funds are obliged to keep reserves necessary to cover deficiencies resulting from mismanagement, fraud or (if relevant) not meeting the minimum required rate of return. Reserves are established at company level, where they serve only for the protection of the members in a given pension fund, or at industry level, where they can be used in the interest of all members of the mandatory plan. In three countries, Hungary, Poland and Estonia, reserves are established both at company and at industry level. In Kazakhstan, Latvia and Bulgaria they are established only at company level.

The highest reserve at company level (1.5 per cent of assets) is required in Poland. However, the amendment to the law that comes into force from 2004 eliminates the company level reserve, creating larger reserves at industry level. As a result of these changes, the costs of reserves will be decreased and the risk for individual managers will be higher. However, overall protection of members' interest will not be affected.

In 2003, the industry reserve level is largest in Hungary, where it represents 0.4 per cent of the industry's assets (after 2004 this level in Poland will be 0.6 per cent of assets). In Poland and Estonia, the industry guarantee fund is backed up with state budget. State budget is also directly providing guarantee for pension savings in Croatia and Macedonia.

### *3.10.3. Custodians*

All countries mandate the managing companies to keep the assets of managed funds in the custody of separate financial institutions. In some of the countries, these institutions have to meet additional

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<sup>26</sup> In 2002 the Polish government proposed an amendment to the law that changes the frequency of calculation to 6 months, based on 3-year performance. The regulation should come in force from 2004.

**Table N° 11**  
**RELATIVE RATE OF RETURN GUARANTEE IN**  
**KAZAKHSTAN, POLAND AND CROATIA**

Country	How is the minimum rate of return calculated?	Frequency of calculation	Covering the deficiency
Kazakhstan	Real returns on pension assets made by particular pension fund may not fall more than 2 percentage points below the average real rate of return made by all pension funds.	The NSC publishes the index for the previous month not later than the 15th of the following month, based on 12-month performance.	(1) additional reserve capital; (2) principal reserve capital, or, as a last resort (3) AMC equity.
Poland	Equal to the lesser of two: 50 percent of the average weighted nominal returns of all asset management companies the index of average weighted nominal returns of all asset management companies less four percent.	The supervision publishes the value of the minimum rate of return every quarter, based on the performance from past 24 months.	(1) reserve capital; (2) PTE equity. If these are not sufficient, the PTE declares bankruptcy and deficiencies are covered from: (3) Guarantee Fund; (4) state budget
Croatia	Minimum rate of return is related to the reference rate of return. The reference rate is equal to actual weighted rate of return - 2 percentage points: If reference rate is above zero, then the minimum rate is equal to a third of reference rate. If reference rate is below zero, the minimum is equal to three times the reference rate. (Subject to a maximum discount rate of the NBC.)	Calculated by HAGENA once a year for a period of a calendar year.	(1) guarantee deposit (2) base capital of the management company (up to 20% of stock) (3) state budget

Source: Country sources and FIAP survey

criteria or to be approved by supervisory authorities. In Latvia and Estonia, the same rules apply for custodians of investment funds and pension funds. In Estonia, additionally, the custodian must have at least one year of experience as custodian of investment funds, in order to become a custodian of a pension fund. In Croatia and Bulgaria, custodians must be approved by Supervision. Minimum capital requirements for custodians exist in Poland and Macedonia.

To summarise, the combination and level of guarantees differs quite significantly between countries. It seems that countries that implemented reforms later have less developed systems of guarantees focusing on preventing fraud and mismanagement, while countries that have reformed their systems earlier tend to include additional rate-of-return guarantees. While deciding on the level of guarantees, the costs for managing companies and subsequently members should be taken into account. Extended system of guarantees might be unnecessary, but very costly. This was the case in Poland, where after five years of experiences the government decided to modify the guarantee scheme, adjusting it to the observed level of risk, which allowed the administrative cost of the system to be reduced.

### **3.11. Disability and survivorship provisions**

The disability and survivor regulations in all countries are currently excluded from the funded scheme. No specific insurance for disability and survivor is envisaged. There are several reasons to explain such decisions.

Firstly, in most of the countries, the pay-as-you-go pillar still plays a dominating role. It could still provide pension provision for non old-age risks. Secondly, shifting the disability and survivor risk would increase the size of transition costs, which was already of concern for most of the countries. Such a change would also mean adjusting disability certification rules to the standards of private provision. In most of the countries it would have meant significant reform of the certification process. Finally, the problem was related to the actuarial assessment of the disability and survivor risks. In most of the countries, the quality of the data would not allow for a proper calculation of risks and premiums.

Given that there was no necessity to make such move, while it could have been technically complicated and expensive for public

finance, the countries decided to retain disability and survivor provision within the framework of the public pay-as-you-go scheme. Though basic survivor and disability insurance is not covered by the funded schemes, some countries try to regulate the system, so that funded tier savings reduce the obligations of the pay-as-you-go scheme. Countries that have such regulations include Croatia, Macedonia and Latvia. The following sub-section describes specific regulation that apply to funded system assets in the case of disability or death of a pension fund participant.

### *3.11.1. Disability regulations*

In the case of disability, two main solutions related to pension fund savings exist:

- (i) the amount of savings is transferred to the pay-as-you-go scheme to cover some costs of disability pension;
- (ii) the amount of savings is kept in the account until the member reaches retirement age.

The first solution is applied in Hungary and, partially, also in Croatia and Macedonia. In Hungary, in the case of disability, the member has the right to transfer his or her savings back to the social insurance agency that, in such case, provides full disability pension. In Croatia, if the single lifetime annuity of a disabled person is higher than the benefit from the pay-as-you-go system, an individual is eligible for lifetime annuity and reduced pay-as-you-go benefit. If not, total accumulation is return to the pay-as-you-go system and full disability pension is paid. In Macedonia, the total pension has to be paid from the first pillar and accumulated assets from individual accounts in the second pillar are transferred to the first one. If accumulated assets are big enough to buy an annuity that is higher than the disability pension received from the first pillar, the disabled will have the option of choosing this annuity<sup>27</sup>.

The second solution is applied in Poland, Latvia and Estonia. In Poland, pension savings of disabled persons are kept in the pension fund until they reach retirement age. If they are working, they also contribute to the pension system according to general rules. At retirement age, the disabled person can choose a higher

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<sup>27</sup> According to the initial design, as there is no legislation on annuities yet.

benefit. If it is the old-age pension, then benefits from first and second pillars are paid. If it is the disability pension, the law does not determine what happens to the funded pillar savings<sup>28</sup>. In Latvia, pension contributions are paid on the basis of the disability pension. At retirement, the first and second pillar account is used to calculate the old-age pension. In Estonia, the pension is paid out according to general rules, on reaching retirement age.

In Kazakhstan, under the new legislation for social allowances, disability benefits have ceased to be insurance benefits and have become flat-rate allowances unrelated to service- or wage-history<sup>29</sup>. In Bulgaria, the disabled worker may transfer the accrued amounts to a life insurance company and buy an annuity there.

### *3.11.2. Survivor regulations*

Regulations on the use of pension savings in case of death of participant in most cases envisage several options for using the amount saved. Solutions differ depending on whether the deceased person was working or was retired.

In the case of workers, the survivors can:

- (i) receive a lump-sum payment;
- (ii) use the inherited amount to buy a lifetime annuity;
- (iii) receive survivor benefit from the pay-as-you-go system, which is partially financed from sources transferred from the funded scheme.

In the case of the death of a pension fund member, in most cases survivors inherit the accumulated assets. In Hungary, the survivor has the right to opt for a lump-sum payment or request an annuity. In Poland, half of the accumulated amount is transferred to the surviving spouse's pension account and is used to buy an annuity when the surviving spouse reaches retirement age. The remaining amount is paid in a lump-sum. A member decides who should be a

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<sup>28</sup> For possible consequences of such regulations see: Chlon-Dominczak (2002).

<sup>29</sup> In Kazakhstan, the longer-run goal for disability and survivor's benefits is the provision of annuities through private disability and life insurance. The government is working on a draft concept paper for the new disability and survivors insurance system. This change must be predicated on the emergence of a well-regulated insurance industry, which is also in process (Andrews, 2001). Given that, only limited regulations regarding disability and survivors are included in funded pillar legislation.

beneficiary of the lump-sum payment (optionally the payment goes to closest relatives). In Bulgaria, survivors can transfer the inherited amount to a life insurance company and buy an annuity there. In Estonia, the pension savings are treated as a part of inheritance and are divided between survivors. Survivors can transfer this amount to an annuity company to buy an annuity.

Another solution is applied in Latvia, where the second pillar is treated as a public scheme. Pension savings left after the death prior to retirement of the participant are remitted to the state budget for financing survivor's benefits for the dependent family members (children) in accordance with the first pillar legislation. In such case, spouses have no right to survivor benefits either in the first or in the second pillar. Also in Croatia and Macedonia, if the lifetime annuity at the time of death exceeds the value of the survivor benefit in the pay-as-you-go system, survivors are eligible for a lifetime annuity. In this case, the pay-as-you-go survivor benefit is reduced. If not, total accumulation is returned to the pay-as-you-go system and full survivor benefit is determined there.

There is ambiguity in the legislation, especially with regards to links between the funded system and disability insurance in Poland and Estonia, that may lead to a higher overall cost of the pension scheme, as private pensions could be paid on top of full disability pensions. Also, in the case of survivors, the law in Hungary, Poland, Bulgaria and Estonia allows for receiving full survivor benefit from the pay-as-you-go system and enjoying benefits from the private scheme, either in the form of a lump-sum or an additional annuity. In Kazakhstan, survivor pensions and disability pensions are flat-rate benefits, paid from the general budget.

In the case of the death of a pensioner who had a right to an annuity, the surviving spouse is entitled to that annuity if the couple purchased a joint annuity or if the annuity had a guaranteed period of payment. In other cases, no benefit is paid from the pension system. If the payment is made in the form of programmed withdrawal, the remaining balance is inherited.

### **3.12. Options available and rules pertaining to the payout stage**

Retirement ages in all countries are the same for pay-as-you-go and funded pillars. Participants are obliged to take their pensions



from both pillars at the same time and it is not possible to take the pay-as-you-go pension earlier and defer the purchase of annuities. Some countries also regulate the use of unisex life tables in order to provide men and women with equal benefits.

Most of the countries mandate the purchase of an annuity and they usually limit the types of annuities that can be provided. Other products are available to only a limited extent in three countries. Kazakhstan currently allows for lump-sum payments, as the value of annuities would be very small. In the future, when pension savings are higher, only annuities will be allowed. Similar regulation exists in Estonia, allowing for lump-sum payments in the case of small value savings. Estonia (for selected cases) and Macedonia also allow for programmed withdrawals.

The regulations applied in five countries and planned regulations in Poland allow non-specialised insurance companies to sell annuities in the mandatory system. Only Croatia limits the annuity provision exclusively to specialised companies, while specialised companies are also allowed (but not exclusively) in Bulgaria. In Latvia, annuities can also be purchased at the Social Security Administration. Pension funds can pay annuities in Hungary and Bulgaria. In the latter case,

**Table N° 12**  
**ANNUITY PROVISIONS IN ECA COUNTRIES**

Country	Products		Providers			Limitations on life tables
	Annuities	Other products	Pension funds	Specialised	Insurance companies	
Hungary	✓		✓		✓	✓
Kazakhstan	✓	✓			✓	✓
Poland <sup>1</sup>	✓				✓	✓
Latvia	✓			✓ <sup>2</sup>	✓	✓
Croatia	✓			✓	✓	✓
Bulgaria	✓		✓			✓
Estonia	✓	✓			✓ <sup>3</sup>	✓
Macedonia <sup>4</sup>	✓	✓				

<sup>1</sup> No regulation yet, based on current government concept

<sup>2</sup> Social security administration

<sup>3</sup> Additional capital requirements

<sup>4</sup> No regulation yet for providers and life tables

Source: country sources and FIAP survey

only pension funds are allowed to provide second pillar life annuities, while insurance companies are allowed to provide annuities in the case of voluntary pension savings.

Annuities regulations are not finalised in Poland and Macedonia. This leaves the pension reforms incomplete. On the one hand, first pension payments in these countries will be made some years ahead, giving some time to prepare the necessary legislation. On the other hand, choices made by people are based on partial knowledge of the system.

Most of the countries require unisex annuities in the mandatory system. This regulation is related to the mandatory character of the scheme and a right to equal benefits for men and women. On the other hand, it creates difficulties for insurance providers, as reserve calculation becomes more difficult and the price of annuity products may be relatively high.

### **3.13. Design of systems - commonalities and differences**

Analysis of the design of funded pensions shows that there are quite significant differences between countries. However, in all cases the regulations are relatively strict, showing the governments' tendency to retain significant control over the mandatory pension savings.

Countries tend to separate pension fund managers from pension funds. From this perspective, Hungary seems to present the worse practice example, where this division is not transparent. As a result, for example, it is quite difficult to assess the price for asset management.

In other countries, the legal structure is based on a concept of separated managers and funds. Pension funds are separate legal entities. Pension fund managers are mostly privately licensed and supervised by public authorities, which is a pre-condition for better performance in the long run (see: Iglesias and Palacios, 2000). As discussed in the next section, public management experience in Kazakhstan and Latvia shows that such managers, though popular at the beginning of the reform implementation, become less popular, as the system develops.

There is a diversity of solutions as far as licensing requirements. In particular, the minimum capital requirement varies quite

significantly. However, this should be viewed in broader perspective - for example quite a high minimum capital requirement in Croatia is combined with no reserve requirement afterwards. In Poland, the minimum capital is lower, but pension fund managers are required to build significant deficiency reserves. Thus, in Croatia, the cost of future insolvency is paid at the beginning, while in Poland it increases the systemic costs.

Another heavily regulated area is the investment portfolio. The best practice can be observed in two countries, namely Estonia and Latvia, which limited their influence in this field to a few rather relaxed limitations and diversification requirements. Other countries to a greater or lesser extent impose strict quantitative requirements. At the other end of the scale, three countries impose explicit requirements to invest at least half of the assets in government bonds. In such cases, one of the goals of pension reform, which is to reduce exposure to government debt, is not achieved in reality.

There are also examples of minimum rate of return requirements, however most of the countries decided not to introduce such guarantees. Given the long-term character of pension provision, minimum rate-of-return requirements re-focus the investment horizon to short-term viewing. Additionally, the minimum rates of return are quite expensive, which leads to higher charge levels and higher costs for members, so it may not be worth keeping such guarantees in the future. Thus, elimination of such guarantees should be considered (the Polish government is already reducing the frequency of the calculation of the minimum rate of return).

Strict regulations also cover the charges of pension fund managers. The law usually defines the structure of charges, with the aim of simplifying choices for the members. Given the usually low level of financial literacy in the countries, such regulation was rather to be expected. It could be replaced by rules regarding reporting and transparency, which unfortunately are not very well developed across countries.

Another area that would require some re-thinking is supervision. In most of the countries, supervisory authorities focus on monitoring whether the pension funds are following numerous regulations. There is also a tendency to create single supervisory authorities. It is a predominant model in the region currently.

Unfortunately, supervisors do not play an active role in developing knowledge within society and providing the public with necessary information and transparent comparisons<sup>30</sup>.

The provision of annuities is only limited to old-age pensions, while disability and survivor payments stay within public pay-as-you-go schemes. Despite such division, some countries envisage using the pension fund's saving to finance part of pension payments under the public system. This shows the difference in perception of old-age and other risks. Old-age pension is perceived more like savings, while the other risks are still viewed in the framework of insurance. The common practice is to limit the types of annuities that can be provided and regulate the providers. Additionally, unisex life tables are usually imposed. The latter is explained by the mandatory character of the scheme, that otherwise would have not been accepted as part of mandatory pension provision, at least in relation to the requirements of ILO or the European Social Charter.

To conclude, the decision to hand over management of mandatory pension savings to private providers was not followed by fully entrusting them with that task. The regulators tend to impose various limitations and requirements for private managers. Though the general goal of such regulation is to increase the safety of individual savings, it may also lead to lower efficiency and returns. As a result, it may result in lower pensions in the future.

#### **4. EXPERIENCE IN THE IMPLEMENTATION OF FUNDED PILLARS**

The design of the system, as presented in the previous section, shows the outcome of theoretical thinking prior to the implementation. The first experiences with the implementation of funded systems show the reality check of these ideas, which may lead to changes in the design. Such changes, introduced in Hungary, Kazakhstan and Poland, have already been indicated earlier. In this section the early experiences with the

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<sup>30</sup> During the research for this paper, the author sought information through the Internet. In majority of the cases, no information was available through the Internet, which shows that access to information is rather limited (also in national languages).

implementation of mandatory funded systems is presented. The analysis concentrates mostly on the experiences of Hungary, Kazakhstan and Poland - the countries that had already introduced funded pillars at the end of 1990s. In some cases, the initial experiences of other countries are shown where possible, in order to present a broader picture of the changes that are occurring in the field of mandatory pension provision.

#### 4.1. Funded system participants

The coverage of the funded system depends on policy choices as discussed in section two, as well as individual choices. As a result, the actual participation varies between countries. Table N° 13 presents the total number of participants and the share of all contributors in the analysed countries.

In the case of four countries, where affiliation was mandated for all (Kazakhstan) or some groups of workers (Croatia, Poland), participation is quite high. In the case of countries where the choice was voluntary for all current workers, the participation is lower.

The number of affiliates increases with time, as more cohorts are covered by the funded system. In the period between 1999 and

**Table N° 13**  
**COVERAGE OF FUNDED PILLARS**

Country	Members of pension funds (thousand)					% of all persons covered by mandatory old-age system (2002)
	1998	1999	2000	2001	2002	
Kazakhstan	3,752	2,995	3,716	4,630	5,141	100.0
Hungary		8,694	9,973	10,637	10,990	76.4
Poland	1,347	2,064	2,187	2,253	2,253	49.6
Bulgaria					1,115	48.4
Croatia					938	67.5
Estonia					210	35.0 <sup>1</sup>
Latvia				275	325	32.0

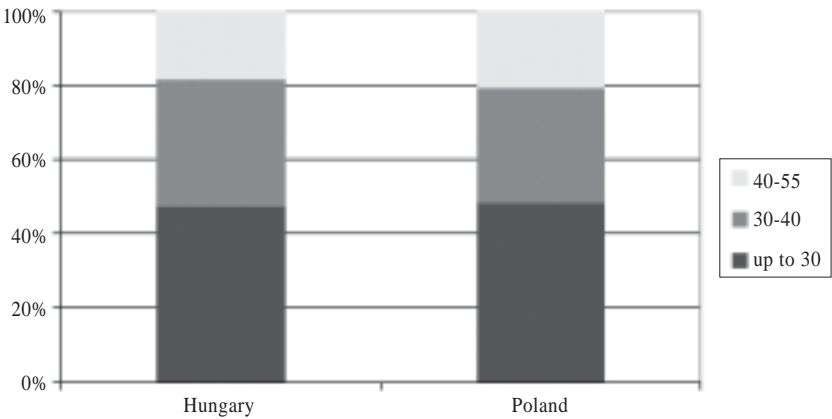
<sup>1</sup> of choice group

Source: country sources and FIAP survey

2002 the number of affiliates in Kazakhstan increased by 70 per cent, in Poland by 20 per cent and in Hungary by 10 per cent. This might lead to the conclusion that, in the case of Poland and Hungary, the market was fully formed in the first year of operations. In Kazakhstan, the increase was much bigger, which shows that people trust the funded system and coverage is expanding.

The age distribution of pension fund members depends on policy choices in the design of the system. Thus, it is quite difficult to make a comparison between countries. However, looking at the age distribution of pension fund members in Poland and Hungary (Figure N° 12), one can observe a lot of similarities, despite differences in design. It shows that younger people tend to participate in funded schemes more willingly than those at the end of their working career.

**Figure N° 12**  
**AGE DISTRIBUTION OF PENSION FUND**  
**MEMBERS IN POLAND AND HUNGARY (2002)**



Source: own calculations based on country sources and FIAP survey

## 4.2. Structure of the market

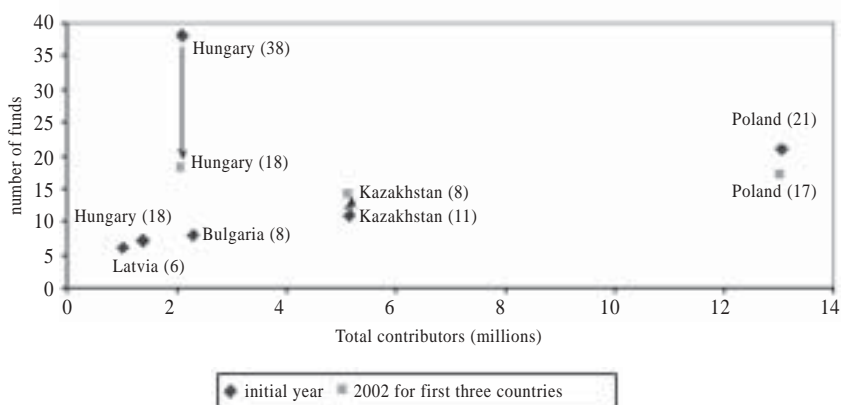
The number of funds varies between countries. In the initial year, the largest number of funds (38) emerged in Hungary, which can be explained by the different legal structure of funds there. In

other cases, the number of funds was much smaller, starting from 21 in Poland to 6 in Latvia and Estonia. In Kazakhstan and Latvia, there are public funds that operate in parallel with private providers. Comparing the number of funds with the total number of insured in the mandatory social security systems in the countries, there is little relation between the number of funds that emerge and the number of contributors. The initial experience of Hungary was particularly interesting, as a very large number of funds emerged in the country, with a small population. With time, as the number of pension funds has evolved, a clearer tendency can be observed. Countries with more contributors tend to have more pension funds.

The countries also differ as regards the average number of affiliates per one fund. The average membership in a pension fund in Poland is 18 times larger than the average size in Estonia. The average size of pension fund is highly correlated with the size of the population (0.98).

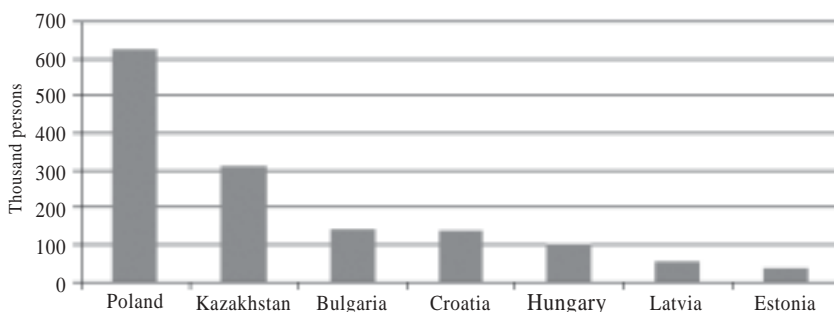
The markets are consolidating (with the exception of Kazakhstan). The number of asset managers decreased significantly in Hungary and, to lesser extent, in Poland. However, the consolidation process is not completed and further mergers or acquisitions are to be expected.

**Figure N° 13**  
**CONTRIBUTORS VS. NUMBER OF FUNDS**



Source: own calculations based on country sources and FIAP survey.

**Figure N° 14**  
**AVERAGE MEMBERSHIP IN 2002**



Source: own calculations based on country sources and FIAP survey

**Table N° 14**  
**NUMBER OF PROVIDERS**

	Initial year	2002
Kazakhstan	10+1	13+1
Hungary	38	18
Poland	21	17
Croatia	7	
Bulgaria	8	
Estonia	6	
Latvia	5+1	

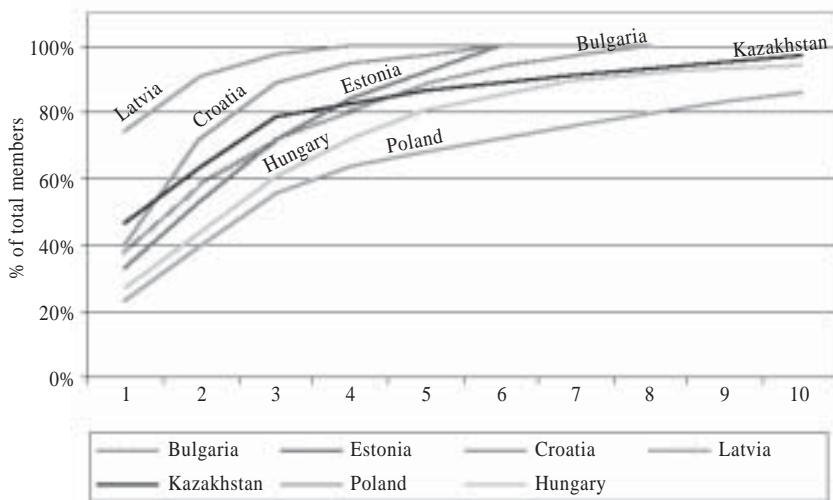
Note: (+1) refers to state pension funds.

Source: country sources and FIAP survey.

The markets are concentrated. In seven of the countries, the top five pension funds have more than 80 per cent of the market. State pension funds dominate markets in Kazakhstan and Latvia, where they hold 46 per cent and 74 per cent of the market, respectively. However, in Kazakhstan the dominance of the state fund is decreasing with time, with the share of the state pension fund in Kazakhstan decreasing from 82 per cent in 1998 to 46 per cent in 2001.



**Figure N° 15**  
**CONCENTRATION OF THE MARKET**



Source: own calculations based on country sources and FIAP survey.

It is expected that dominance of the state funds will decrease, as most of the transfers of members between funds observed in Kazakhstan and Latvia are from state to private pension funds. In the first months of 2003, around 12 per cent of participants in Latvia left the state pension fund. It may be expected that the situation in Latvia will be similar to the developments in Kazakhstan.

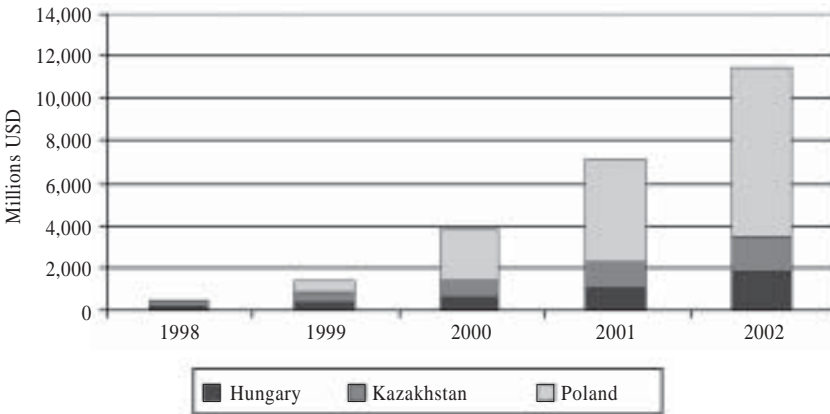
In the other countries, there were fewer transfers of members between funds than expected. In Hungary, only around 1 per cent of members changed pension funds. In Poland, the number of transfers is increasing. In 2000, 1.4 per cent of members decided to change pension fund, while in 2002 this share increased to 3.1 per cent. It may be attributed to the fact that Poles are allowed to switch between funds, without a transfer fee, after 24 months of participation. For most of the pension fund's members, the 24-month period was completed in the course of 2001.

#### 4.3. Assets and investments

The assets of the pension funds are growing fast in all the countries, as was expected. The size of the pension funds' assets is

highest in Poland, where by the end of 2002, total assets accumulated by pension funds reached almost USD 8 billion. Assets of pension funds in Kazakhstan and Hungary represented each around a quarter of the Polish market. By 2030 it is expected that the total assets of pension funds in Poland will represent around 80 per cent of the GDP, while in Hungary it should be around 30 per cent of the GDP.

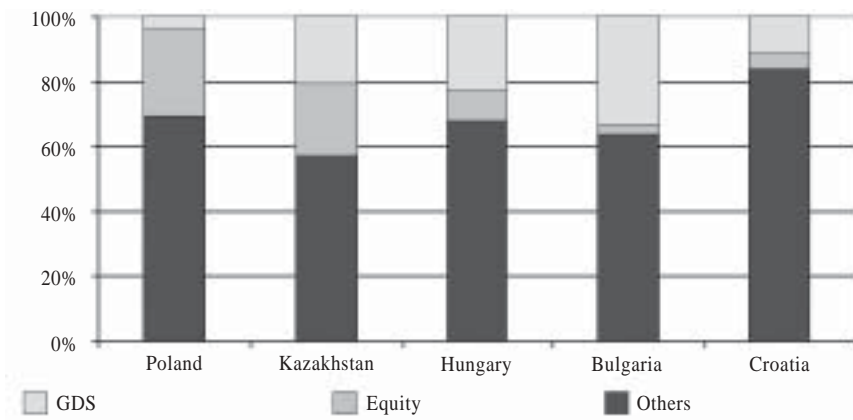
**Figure N° 16**  
**EVOLUTION OF ASSETS OF PENSION FUNDS AT THE END OF 2002**



Source: own calculations based on country sources and FIAP survey.

Pension funds invest the majority of their assets in government debt securities (from 57 per cent of assets in Kazakhstan to 83 per cent of assets in Croatia). Investment in equity is smaller. It also varies significantly between countries. The largest share of such investment is observed in Poland (27%) and Kazakhstan (22%) and the lowest in Bulgaria (2.6%). Investment strategies significantly differ from pension fund investment in developed economies, where the share of investment in equity is larger. As in Kazakhstan, Bulgaria and Croatia such investment strategy is forced by regulations, the significant share of assets in government debt securities in Poland and Hungary can only be explained by the lack of appropriate financial instruments on local markets combined with high risk aversion on the part of pension fund managers.

**Figure N° 17**  
**PENSION FUND PORTFOLIOS**



Source: own calculations based on country sources and FIAP survey.

In the future it will be necessary for pension funds to invest a higher proportion of their assets in non-government instruments, in order to achieve better diversification of risk. As all countries, except Kazakhstan, decided to retain a significant public component, the state implicitly bears the risk of the entire pay-as-you-go pillar and explicitly of that part of the funded pillar which is invested in public debt. Such a strategy contradicts the goal of the pension reforms, which was also to diversify public risk within a pension system.

Pension funds are starting to play an important role as institutional investors. For example in Poland, by the end of 2002, more than a third of stock market capitalisation was held by pension funds. It means that in order to develop in the future, pension funds will need to broaden their base for investment, to include both new instruments becoming available on the local market and increased limits on international investment.

Concerning rates of return, available information is rather limited. Hungarian pension funds did not provide information on a comparable basis, but the net returns in 2001 were estimated by financial supervision at 6.1 per cent.

In Kazakhstan, the real returns were quite stable for the period 2000-2002, with average real return at the level of around 6 per cent and standard deviation from the average not exceeding 1 percentage point. Between mid 2002 and mid 2003 the real return worsened. At the same time the difference between performances of separate funds increased. There is an observable difference in performance between private and state funds in Kazakhstan. In the period 2000-2001, private funds performed better, while between 2001 and 2003, the state accumulation fund had higher returns. This may be a result of higher investment in government bonds in the case of state fund, combined with a relatively poor performance of the financial market in 2002 (see Table N° 15). In all the periods, the real returns from pension funds were lower than the growth of real wages in Kazakhstan, which were increasing fast, following rapid economic growth in the country.

In the period 2000-2002 the compounded average real rate of return for Polish pension funds was higher than the average real wage growth or real deposit rate. The interesting feature of Polish pension funds is the diversity of results, as the difference between the worst performing fund and the best performing fund in each year was around 10 percentage points. This is explained by the relatively higher exposure to equity compared with the other countries, as well as differences in investment policies. The performance of the Warsaw Stock Exchange in the period 1999-2002 was rather weak, particularly in the case of IT companies, which triggered negative returns for some of the funds (particularly in 2001). Looking at annual figures, the returns boosted in 2002, following rather small real returns in 2000 and 2001. This is related mainly to higher real returns on government bonds, resulting from a sharp decline in inflation combined with strict monetary policy. Additionally, there was some improvement in the stock market, compared with the year before.

#### **4.4. Costs and charges**

One important aspect of the funded system's performance is the charges and costs of the system. Limitations on the structure size of charges are included in the legislation, as described in the previous section. Despite these limitations, the experience of countries shows significant differences between individual pension funds.

As the charge level in the countries that are only just launching the system can be biased, the comparison can be made on the basis of the countries with longest experience - Kazakhstan, Hungary and Poland. In Hungary, the legal structure of funds makes the charge level impossible to assess. In view of that fact, the analysis of costs and charges is based on the example of Kazakhstan and Poland.

**Table N° 15**  
**REAL RETURNS OF PENSION FUNDS**

**a. Kazakhstan**

	June 2000 June 2001	October 2001 October 2002	June 2002 June 2003
Weighted average	6.81%	6.50%	4.12%
Non-state Accumulation Funds:			
Standard deviation	1.01%	0.51%	1.96%
Minimum	5.44%	5.33%	-1.07%
Maximum	8.70%	7.07%	5.41%
State Accumulation Fund	5.14%	9.04%	5.19%
	<b>2000</b>	<b>2001</b>	<b>2002</b>
Inflation rate	13.2%	8.4%	5.9%
Real wage growth	5.7%	9.5%	10.0%
Bank deposit rate (nominal)	14.7%	12.8%	11.0%

**b. Poland**

	December 1999 December 2000	December 2000 December 2001	December 2001 December 2002	December 1999 December 2002
Weighted average	4.5%	2.1%	14.5%	24.4%
Standard deviation	3.5%	3.5%	2.7%	5.4%
Minimum	-0.9%	-5.4%	6.3%	14.0%
Maximum	12.5%	6.3%	16.6%	32.1%
	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2000-2002</b>
Inflation rate	8.5%	3.6%	0.8%	13.3%
Real wage growth	4.2%	3.6%	2.7%	10.8%
Real bank deposit rate	6.5%	4.4%	3.8%	16.6%

Note: inflation rate: December to December.

Deposit rate: weighted average of 12 month deposit rate in December.

Source: Own calculation based on country sources: statistical offices, central banks data, Asian Development Bank.

Figure N° 18 presents the cost and charge curves for pension funds in Kazakhstan and Poland, including fitted logarithmic regression. The level of costs per member in both of the cases shows that there are some economies of scale. This relation is stronger in the case of Kazakhstan and weaker in the case of Poland. Comparison of charge levels does not lead to the same conclusion. In both cases, the fitting of the estimation is worse. In Poland, it can be even observed that there is a positive correlation between the number of members and charge per account.

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A comparison of the level of charges and costs shows that, in most cases, Polish pension fund managers charged pension fund members less than the actual cost level. In the case of Kazakhstan it was less so. However, the results may not be fully accurate, as the cost data excludes the costs of the asset management company, which are not attributed directly to managed funds (one asset management company manages more than one fund).

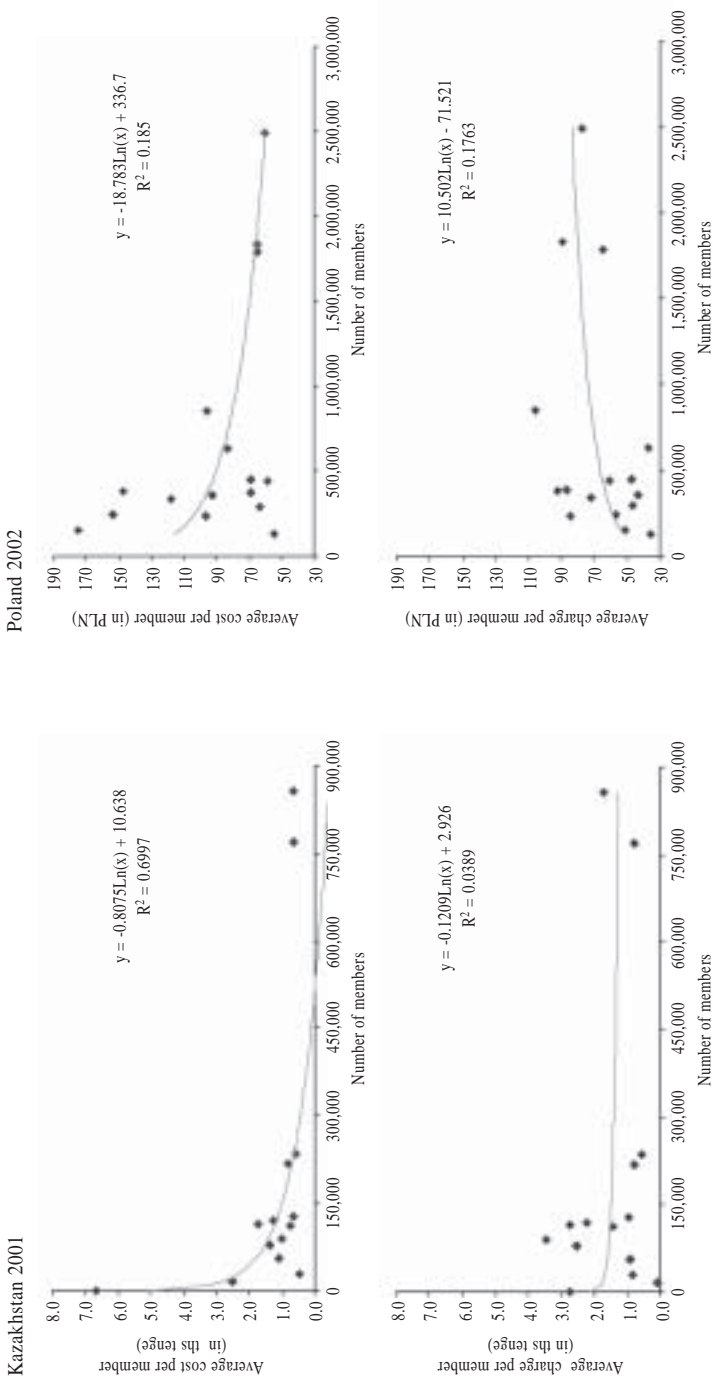
To conclude, there are economies of scale in the case of cost per member. It may lead to the intensification of the consolidation processes in the future (which are already to be observed in the case of Poland). Limits on charge level and charge structure affect the level of actual charges. This can affect competition between funds and may lead to inefficiencies in the system.

More detailed analysis of the Polish case<sup>31</sup> allows some further conclusions to be drawn about the development of costs and charges in time. In the period from 2000 until 2002, the market was still experiencing deficits. However, the difference between costs and charge revenues was decreasing and probably in 2003

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<sup>31</sup> That has several years of experiences and a market structure that is homogeneous (contrary to Kazakhstan, where as shown earlier, significant proportion of assets is held in the state accumulation fund).

**Figure N° 18**  
**COST AND CHARGE CURVES**



Source: Own calculation based on KNUiFE (Poland), Dobronogov and Shadykul, 2003 (Kazakhstan)

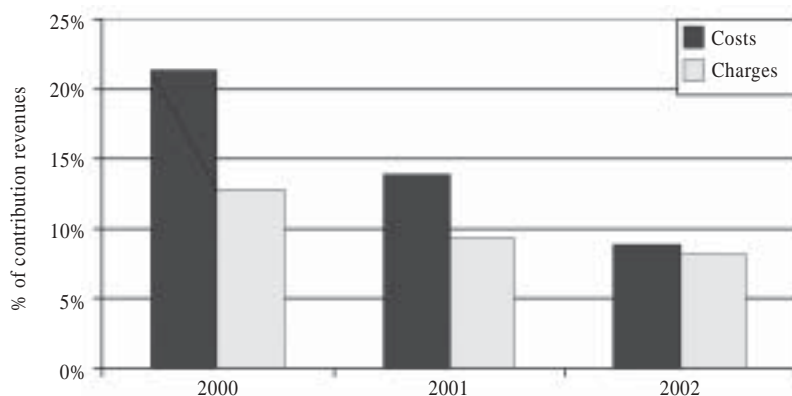
the market will register surpluses. The observed reduction of deficit is mainly due to the significant cost reduction. Total costs in 2002 in relation to contribution revenues were less than half of those in 2000 (Figure N° 19).

Looking in greater detail at charge revenues, in the period of 2000-2002 the revenues from charges were also decreasing. The decrease was mainly a result of reduced up-front fees. The rates of these fees, in the case of almost all pension funds, are decreasing after two years of participation. The asset management fee revenues are higher with the increase of assets. The revenues from transfer fees are rather small. Decreased revenues from up-front fees dominate the total effect and the charges relative to contribution revenues are falling.

In the future, as further price limits are imposed, the revenues of pension fund managers will be even smaller. However, this will be offset by lower costs, related mainly to reduced reserve requirements.

The reduction of costs was mainly achieved by lower sales and marketing expenses. In 2002, this costs item represented around a fifth of total costs, while in 2000 it was more than a half. In the period between 2000 and 2002, the costs of reserves and

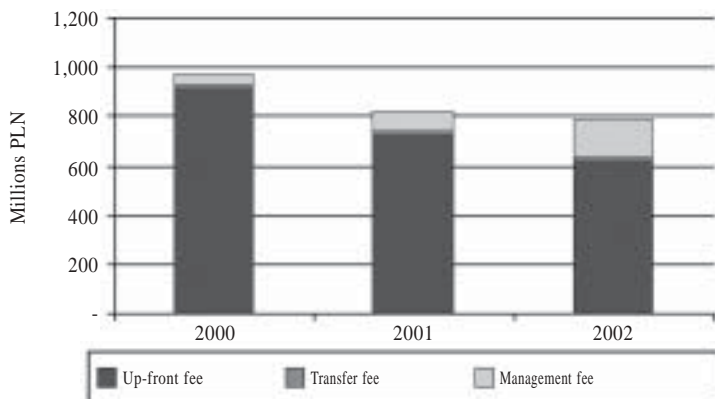
**Figure N° 19**  
**COSTS AND CHARGES IN POLAND**



Source: KNUiFE



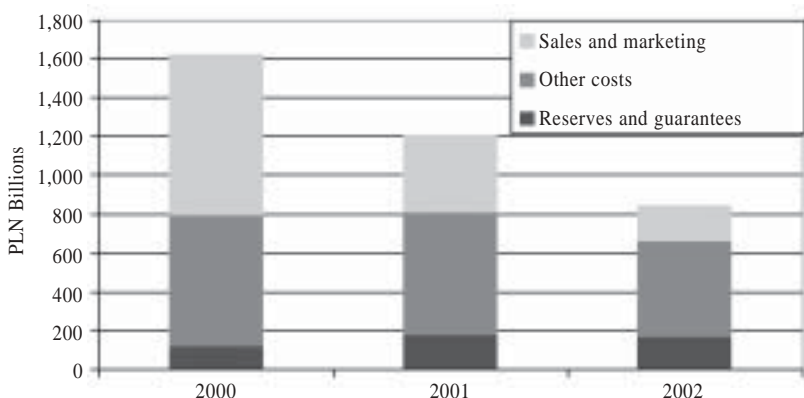
**Figure N° 20**  
**CHARGE LEVEL AND STRUCTURE**



Source: own calculation based on KNUiFE data

guarantees increased slightly. The increase was related to the total increase in asset level. It is expected that pension fund managers in Poland should break-even after around 10 to 12 years of operations.

**Figure N° 21**  
**STRUCTURE OF COSTS**



Source: own calculation based on KNUiFE data.

The results of an analysis of the costs for individual pension funds in Poland, Kazakhstan and Croatia (World Bank, 2003) show that the cost per account is fairly well explained by the level of assets per account and number of accounts. The regression fit is especially good, when the costs are expressed in relation to average wages in a given country. Thus, preliminary conclusions show that there are some economies of scale observed, which is consistent with earlier observations.

**Table N° 16**  
**ADMINISTRATIVE CHARGES AND THEIR IMPACT**

	(1) Poland 2001	(2) Poland draft legislation	(3) Kazakhstan 2001	(4) Kazakhstan -new law	(5) Croatia 2002	(6) Croatia -draft legislation
Up-front fee (% contribution)	8.5*	7.0**	1	0	0.8	0.8
Management fee (% assets)	0.6	Up to 0.54%	None	0.6	None	1.2
Rate of return fee/ performance fee' (% return)	None	Up to 0.06% of assets	10	15	25	None
Reduction in assets	17.4	14.4	10.3	16.5	29.3	26.4
Reduction in yield	0.82	0.65	0.37	1.13	1.61	1.19
Assumptions:						
Wage growth (% pa)	2	2	2	2	2	2
Rate of return (%)	4	4	4	4	4	4
Contribution history (years)	40	40	40	40	40	40
Average account size (in US\$)	456		236		212	
Annual charge per account (in US\$)	19.3		8.8		3.6	
Charge/unit of assets (%)	4.3		3.7		1.7	

\* Schedule of up-front fees falls with length of contribution to 5.6 percent for individuals with more than 26 years of contributions.

\*\* Draft legislation lowers cap on up-front fee from 7 percent to 3.5 percent over a ten-year period.

\*\*\* Draft legislation introduces a performance premium fee, capped at 0.06 percent of assets, related to fund performance.

Data for Croatia are for end of Q3, 2002. Charge per account does not include the 'performance fee' as the rate of return is computed at the end of the calendar year.

Source: World Bank (2003)

What is also interesting, in all three analysed countries, is that the initial fee structure envisaged in the law has been amended, or amendment is under consideration (World Bank, 2003). As a result of the changes, the overall charge ratio goes down in Poland and Croatia, while it increases in Kazakhstan. As a result, the total costs will be lowest in Poland and highest in Croatia. Such significant differences between charge levels cannot be explained by legislative requirements. On the contrary, pension fund managers in Poland pay for collections; they maintain individual accounts and finance the high reserve requirements, which is not the case in Croatia. In the future, further convergence in the level of fees can be expected.

## CONCLUSIONS

Multi-pillar pension systems are becoming more popular in Central and Eastern Europe. Eight countries already have mandatory funded components as a part of their pension system design, others are considering following the same path<sup>32</sup>. Contrary to the experiences in Latin America, in Central Europe funded pensions are usually only a small fraction of the entire social security system. Only in Kazakhstan has the funded system substituted the pay-as-you-go one.

The size of funded systems is usually not big, which results from the high current costs of pensions and high implicit debts that need to be financed. However, on the other hand, such schemes help to reduce the implicit pension debt in the future, which makes them attractive for the countries in the region, which usually have high implicit pension debts.

Implementation of funded systems is also accompanied by significant savings measures in the pay-as-you-go systems. The most popular are increased retirement ages, lower indexation of pension benefits and lower accrual rates. In two cases (Poland and Latvia) the pay-as-you-go schemes were transformed into notional defined-contribution schemes. From the political economy perspective, the creation of funded accounts is well perceived by

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<sup>32</sup> Introduction of funded systems is for example discussed in Slovakia, Lithuania and Romania.

the public and thus helps to justify unpopular, but necessary, cuts in pay-as-you-go systems.

Analysing the design of funded schemes, several conclusions can be drawn. Firstly, the legislation focused on developing systems that would be trusted by the population. It was especially important in these countries, where some difficulties in financial markets had already occurred (i.e. bankruptcies of banks or insurance companies). As a result, the law tends to over-regulate the market. In the long run, this can lead to building significant inefficiencies in private asset management. The smaller countries and those which introduced reforms later (i.e. Latvia or Estonia) provide a good example in this respect, limiting public interference in private provision, regulating only those components which are necessary to assure elimination of fraud or misuse of funds.

As first experiences show, the bulk of assets is kept in government bonds. Such performance is linked either to explicit requirements or the implicit market situation. For example in Poland, though the law allows for larger market exposure, there are no instruments that can effectively be purchased. As international diversification is practically not allowed, pension funds are forced to buy government bonds. In all the countries, development of the financial markets combined with international diversification is a necessary condition for the future good performance of pension funds. Currently, all the countries fall short in providing such a requirement.

Similarly in the future, the elimination of minimum rate-of-return guarantees should be considered. Such guarantees firstly lead to the “herding” effect, as small funds follow the behaviour of bigger ones. Secondly, the guarantees are also expensive, as fund managers need to keep necessary reserves or capital in order to meet the deficiency. It means that participants pay a part of their charges in order to have the guarantee, which does not necessarily lead to increased value of pension savings. Guaranteed rates of return also increase the state risk, as in all cases the state budget is a final payer of the deficiency. In the future, closer attention should be paid to the governance and transparency of functioning of the pension funds. Prudent government and transparency regulations could replace costly guarantee schemes.

The level of costs and charges varies between countries. Efforts can be observed to reduce the overall costs. The regulations in this respect

mostly concentrate on introducing charge restrictions and price caps. On the one hand, country legislations impose certain level of costs (for example, costs of central collections or mandatory reserves). On the other hand, knowledge about costs is rather limited among pension fund members and the public authorities and supervisors do not act to improve this situation. Prices should be formed on the bases of market forces, rather than following administrative regulations.

To conclude, in the future greater attention should be paid to such elements as:

- prudent supervision;
- well designed investment criteria, in particular re-viewing the caps on equity and foreign investments as well as eliminating the requirements to invest in bonds;
- transparency and accountability;
- cost reduction including the systemic costs (induced by regulation) and following competition on the market;
- good design of the level and structure of guarantees.

Provided that these elements are in place, the funded pensions will be viewed as a successful example of public-private partnership in the pension provision for individuals in Central and Eastern Europe and in Central Asia.

## APPENDIX

**Table A N° 1**  
**POPULATION, LIFE EXPECTANCY AND**  
**DEPENDENCY RATES IN 2002**

2002	Hungary	Kazakhstan	Poland	Latvia	Croatia	Bulgaria	Macedonia	Estonia
Total population, thousands	10,075	16,742	38,230	2,367	4,391	7,621	2,055	1,416
Total fertility rate	1.25	2.12	1.37	1.18	1.93	1.13	1.77	1.24
Life expectancy at birth, total	71.9	63.38	73.66	69.00	74.13	71.5	74.26	70.02
Men	67.55	58.02	69.52	63.13	70.52	67.98	72.01	64.03
Women	76.55	69.01	78.05	75.17	77.96	75.22	76.68	76.31
Population 15-64. %	68.8	66.5	69.5	68.6	66.3	68.5	67.2	68.5
Population 65+. %	14.8	7.5	12.6	15.6	15.4	16.9	10.4	15.1
Dependency rate (65+/15-64)	21.51	11.28	18.13	22.74	23.23	24.67	15.48	22.04

Source: <http://www.cia.gov>. GUS (Central Statistical Office) for Poland.

**Table A N° 2**  
**POPULATION, LIFE EXPECTANCY AND**  
**DEPENDENCY RATES IN 2050**

2050	Hungary	Kazakhstan	Poland	Latvia	Croatia	Bulgaria	Macedonia	Estonia
Total population, thousands	7,589	13,941	33,004	1,331	3,587	5,255	2,174	1,113
Life expectancy at birth, total <sup>1</sup>	79.3	76.0	80.1	79.1	79.6	78.7		79.4
Men <sup>1</sup>	76.0	72.8	76.9	75.4	76.6	75.8	75.1	75.8
Women <sup>1</sup>	82.4	79.0	83.3	82.6	82.6	81.6	80.0	82.7
Population 15-64, % <sup>1</sup>	57.2	63.7	57.2	54.9	59.1	56.2	61.8	57.5
Population 65+, % <sup>1</sup>	28.8	20.0	28.5	30.8	25.1	29.9	21.1	27.8
Dependency rate (65+/15-64) <sup>1</sup>	50.4	31.4	49.8	56.1	42.5	53.2	34.2	44.9

<sup>1</sup> Data for 2045 - 2050,

Source: UN population projections, for Macedonia: Projections of the Actuarial Unit of the Pension and Disability Insurance Fund of Macedonia.

**Table A N° 3**  
**CHANGES IN THE ACCRUAL RATES**  
**IN SELECTED COUNTRIES**

Country	Accrual rate switchers (per cent of individual base)		Accrual rate non-switchers (per cent of individual base)	
Hungary <sup>1</sup>	1.55 (prior to 2013) 1.65 (after 2012)		1.55 (prior to 2013) 1.22 (after 2012)	
Macedonia	<i>Before switching:</i> 2.33 (men) 2.60 (women)	<i>After switching:</i> 0.75 (men) 0.86 (women)	<i>&gt;15 years of service on 1.01.2001</i> 35% for 15 years service + 1.8% for each additional year (men) 40% for 15 years service + 2.6% for each additional year (up to 20 years of service) + 1.8% for each additional year (women)	<i>&lt; 15 years of service on 1.01.2001</i> <i>Before 01.01.2001:</i> 2.33 (men) 2.60 (women) <i>After 01.01.2001:</i> 1.80 (men) 2.05 (women)
Bulgaria	Accrual rate is 1 per cent. For those in the funded system, the individual coefficient is reduced proportionally to the size of the funded pillar contribution paid.			
Estonia	Accrual rate is reduced by 20 per cent (for the period of funded pillar participation)			

<sup>1</sup> Accrual rate depends on the retirement date.

Source: Country sources and FIAP survey.



**Table A N° 4**  
**CONTRIBUTION RATES IN ANALYSED COUNTRIES**

	<b>Total contributions</b>	<b>Employee and employer division</b>	<b>Funded pillar</b>	<b>Ceiling on contributions</b>
Bulgaria	<p>The Public Social Security Budget Law each year determines the contribution rate and its statutory breakdown, which is based on the distribution of the state resources to separate public social security funds and supplementary mandatory pension funds. In 2003 the following division applied:</p> <ol style="list-style-type: none"> <li>for the 'Pensions' Fund: 29% or 32 % - for persons working under hard and hazardous working conditions of 1<sup>st</sup> and 2<sup>nd</sup> labour categories, who are born before January 1<sup>st</sup> 1960 and 30% for persons, born after December 31<sup>st</sup> 1959.</li> <li>for the General Sickness and Maternity Fund - 3 %.</li> <li>for the Work Injury and Occupational Sickness Fund - 0.7 %.</li> <li>for the Unemployment Fund - 4 %.</li> <li>for supplementary mandatory pensions by occupational private pension funds:</li> </ol>	<p>Social security contributions for pensions are divided between contributor and beneficiary in the following ratio:</p> <p>in 2000 - 2001 - 80:20;  in 2002 - 2004 - 75:25;  in 2005 - 70:30;  in 2006 - 65:35;  in 2007 - 60:40;  in 2008 - 55:45;  in 2009 and after - 50:50.</p>	<p>Universal Funds: 2% rising to 5% by 2007, for those born after 1959. Universal Funds cover the risk of old-age</p> <p>Occupational Funds: additional 12% or 7% fr persons (about 120 thousand) working under hard or hazardous conditions. Occupational Funds provide limited period annuities for early retirement, until reaching the general retirement age.</p>	<p>Social security contributions for workers and employees are charged on the basis of the received gross monthly income, but not less than the minimum and not more than the maximum income, fix by the state. The minimum and maximum income are determined each year for the purposes of the social security by the Public Social Security Budget Law. The following amounts of the monthly incomes are established for 2003:</p> <ol style="list-style-type: none"> <li>minimum monthly income during the calendar year according to economic activities and groups of occupations by activity and by type of occupations</li> <li>minimum monthly income for self employed persons - 200 BGN<sup>33</sup>.</li> <li>minimum monthly income for farmers - 100 BGN.</li> <li>minimum monthly income for farmers, who do not have other Occupation - 50 BGN.</li> </ol>

<sup>33</sup> The official currency of The Republic of Bulgaria - the Bulgarian Lev (BGN) is fixed to the Euro, under the conditions of Currency Board at the fixed exchange rate of 1.95583 BGN per 1 EUR. The monthly average exchange rate of the Lev against the US Dollar for January 2003 is 1.84170. The annual average exchange rate of the Lev against the US Dollar for 2002 is 2.07697; for more information [www.bnb.bg](http://www.bnb.bg)

Table A N° 4 continued

	<b>Total contributions</b>	<b>Employee and employer division</b>	<b>Funded pillar</b>	<b>Ceiling on contributions</b>
	<p>a) 12 % - for persons working under the conditions of 1st labour category;</p> <p>b) 7 % - for persons working under the conditions of 2nd labour category.</p> <p>6. 2% for supplementary mandatory pensions by universal private pension funds for persons born after 31.12.1959</p>			<p>5. maximum monthly income - 1 000 BGN.</p> <p>Social security contributions for workers and employees are estimated on the basis of the received gross monthly income, but not less than the minimum monthly income, and not more than the maximum monthly income.</p>
Croatia	20% for old-age, disability and survivor	All paid by employer	5% (only old-age)	Six gross average wages.
Estonia	20% (PAYG only) 22% (PAYG and funded)	<p>Non-switchers: 20% employer 0% employee</p> <p>Switchers: 20% employer 2% employee</p>	<p>4% employer 2% employee</p>	No ceilings exist
Hungary	For all risks: 26% (2002) 26,5% (2003)	<p>Employee: 8% (until 2002) 8,5% (from 2003) Employer: 18%</p>	<p>6% (2002) 7% (2003) 8% (2204)</p>	<p>For employees 200% average wage (or 6490 HUF per day) (employees only) in 2002. 250% of average wage (10 700 HUF per day) in 2003. No ceiling applies to employer contributions.</p>
Kazakhstan	10% for funded old-age scheme; other social transfers financed from social tax paid by employer (21% of the wage bill)	Fully paid by employer	10%	No ceilings are applied.

Table A N° 4 continued

	<b>Total contributions</b>	<b>Employee and employer division</b>	<b>Funded pillar</b>	<b>Ceiling on contributions</b>
Latvia	20.0% old-age 5.59% survivors 3.31% disability 2.16% sickness and maternity 0,09% work injury	33.09% in 2003 where: 24,09% is paid by employer (including full work injury contribution) 9% is paid by employee	Currently 2%, but it is planned to increase this rate to 9%	In 2003 the maximum amount of income from which social insurance contributions are paid is 18400 LVL. The maximum amount of income is calculated taking into account the real wage and salary index, which is calculated by the Ministry of Finance on the basis of expected wage and salary growth rate (or disparity between wages increase and decrease).
Macedonia	Total contribution rate is 21.2%. There is no statutory break down of contribution rate for pensions, other than one between pillars: I pillar shall provide: old-age, disability, survivors and minimum pensions and II pillar shall provide old-age pensions only.	All paid by employer	7%	There used to be maximum pension and there was no ceiling on contributions. This will remain in force for contributors that will stay in the I pillar only. But, for the switchers into the two-pillar system there will be ceiling: not higher than 3 average monthly wages of the Republic.
Poland	19.52% old age 13.00% disability and survivor 2.45% sickness 0.4-8.12% work injury	Old-age disability and survivor contributions: $\frac{1}{2}$ employee and $\frac{1}{2}$ employer sickness: fully employee work injury: fully employer	7.3%	Miniumum: for employees: not less than minimum wage as set in the law (full-time job) for self-employed: 60% of average wage in previous quarter.  Maximum: For both employees and employers: 250% of average wage (on annual basis)

Source: Country sources and FIAP survey

**Table A N° 5**  
**TYPES AND LIMITS ON CHARGES**  
**IN ECA COUNTRIES**

	Admission fee	Contribution based fee	Asset management fee	Fee from investment
Hungary	Up to 400 HUF		No limit	
Kazakhstan		fee deducted from the fund: up to 1% of contributions Asset Management Company up to 0.15% of contributions		Not more than 10% of investment income (of which Asset Management Company can take up to 5%).
Poland		No limit	Up to 0.6% of assets	
Croatia		Up to 0.8% of contributions	Up to 0.8% of assets	Up to 25% of the profit made on investment
Latvia		Until 2004 covered from the state budget. After 2004 capped at 2.5%	Until 2003 covered by the state budget	
Bulgaria		Up to 5%	Up to 1% of assets per year	
Estonia		Up to 3%	Established by the Minister of Finance. Currently not more than 2% of the market value of pension funds assets	
Macedonia		1% (set on tender)	Up to 0.6% of assets	

Source: Country sources and FIAP survey.

**Table A N° 6**  
**LICENSING CRITERIA TO ESTABLISH**  
**THE PENSION FUND AND PENSION FUND**  
**MANAGEMENT COMPANY**

Country	Minimum capital	Legal documents	Certificates and processes	Experience
Hungary	None	The deed of foundation; the fund's by-laws; court's decision on the registration of the fund;	Certificate proving the required number of members; short and long term financial plan; internal regulation on asset management and valuation; internal control system; contracts with third-party administrators and asset managers (if any) and the custodian institution	Details of the members of the board and on the official auditor; certificate on personal, material and IT (database) conditions;
Kazakhstan*	90 million tenge (0.61 million USD)			Top managers shall: have higher education be not convicted; not be a top manager of a company that went bankrupt o was liquidated; pass a qualification exam.
Poland - managing company	4 million euro (4.6 million USD)	Articles of association;	Organisational and financial plan for the next 3 years organisational regulation information on shareholders	Top managers should not be convicted in the past. Shareholders should have sound financial situation (proved by presenting necessary financial documentation for past 5 years).
Poland - open pension fund	None	Draft articles of association; draft agreement with custodian;		Information on persons that will be involved in asset management; information on persons employed by custodian that will directly be involved in monitoring funds' operations; information on qualifications and professional experience of investment advisors.
Latvia	Deposit of not less than 50 000 lats to be used for compensating of the loss. (0.09 million USD)	Elaborate and approve a pension plan (systematised rules for the pension benefits accumulation with the pension fund, their investment and benefits payments);	Approve the pension fund's asset manager and conclude an agreement with the asset manager and an agreement on the placement of the asset manager's security deposit; provide a	Members of the board of directors of the pension fund, auditors and members of the audit commission shall not be natural persons who at the moment of assuming such responsibilities are subject to criminal prosecution, or

Table A N° 6 continued

Country	Minimum capital	Legal documents	Certificates and processes	Experience
		approve the pension fund's asset custodian and conclude an agreement with the custodian;	system for the calculation and accounting of the accumulated additional pension attributable to each pension plan member; prepare and approve a business plan for the next three years.	have been convicted of an intentional crime. Members of the board of directors of the pension fund, auditors and members of the audit commission may be persons who: 1. are sufficiently competent in financial management issues; 2. have an adequate education and professional experience; 3. have an impeccable business reputation; and 4. provided that their right to perform the entrepreneurial activity has not been revoked.
Croatia	40 million kuna (5.8 million USD)	Statute of the pension fund management company; list of shareholders; contract with the custodian bank	Licensed (or temporarily licensed) management board business and financial plan for 5 years;	University degree; experience in managing companies of comparable size and type of business;
Bulgaria	3 million leva (1.77 million USD)	The Rules of Operation and Organisation of the pension fund; a copy of the contract with the depository bank; a certificate of the actual legal status of the pension insurance company the statute of the pension insurance company managing and representing the pension fund;	Actuarial projections for the pension schemes offered by the company; business and financial plans for the first three years	A list of all members of the managing bodies of the pension insurance company, of the shareholders with more than 1% of the shares and of the actuaries, different personal requirements apply to each group
Estonia	30 million kroons (2.2 million USD) from 2007: 45 million kroons			Education, experience and professional qualifications necessary to manage a pension fund.
Macedonia	1.5 million euro (1.72 million USD) plus each founder company should have at least 20 millions euro share capital	– draft statute of the Pension Company; – draft by-laws of the Pension Fund it would govern; – draft contract with the proposed Custodian; – a declaration signed by	– minimum 3 years of existence of founder companies; – solvency of shareholders; if foreign institution: at least one year of a minimum investment grade by reputable	– a list of candidates for members of the board of management and supervisory board of the Pension Company along with statements by the candidates that they agree to perform these functions if the bid is successful and fulfill any

Table A N° 6 continued

Country	Minimum capital	Legal documents	Certificates and processes	Experience
		<p>authorized signatories of each applicant that if awarded a license, they will found the Pension Company and Pension Fund in accordance with the provisions of this law; a list of founders along with information as to whether they are connected companies and as to the nature of their connections;</p> <p>– Following its incorporation, the Pension Company is required to submit certified copies of the constitutional documentation and by-laws of the Company, copies of the latest versions of the draft statute of the Pension Company; draft by-laws of the Pension Fund it would govern; draft contract with the proposed Custodian.</p>	<p>international rating agencies;</p> <p>– documents confirming that founders which would hold at least 51% of the initial share capital of the Company have substantial experience of asset management and as at the date of application and for at least one year prior to that date it must have had a minimum investment grade level rating by reputable international rating agencies</p> <p>– in relation to each founder, certified copies of the corporate statutes and excerpt from the registry court, the names and addresses of board members and certified copies of three most recent financial statements as well as any additional evidence necessary to show that the requirements for founders are satisfied;</p> <p>– documents confirming the origin of financial resources allocated to pay up the Pension Company's share capital;</p> <p>– a plan for the implementation of the creation of the Pension Company and Pension Fund as well as an organizational plan outlining the structure of the Pension Company;</p> <p>– a statement of the investment strategy for the Pension Fund;</p>	<p>requirement set out in the Law once appointed including resignation from any conflicting positions prohibited by this law, as well as a description of their qualifications and their prior professional activities;</p> <p>– details of senior personnel that it is proposed will be responsible for investment management decisions;</p> <p>– a certificate from the applicant stating that members of the statutory governing bodies of the Pension Company pursuant to this Law have no security measure imposed in the fields of law, banking, accountancy, insurance, asset management and investment, pension fund management or financial services;</p>

\* For private providers

Source: Country sources and FIAP survey

**Table A N° 7**  
**PORTFOLIO LIMITS**

	Hungary	Kazakhstan	Poland	Latvia	Croatia	Bulgaria	Macedonia	Estonia
Government bonds	no limit	min. 50%	no limit	no limit	min. 50%	min 50%	80% <sup>1</sup>	min. 35%
Corporate bonds	30%		10% (publicly traded) 5% (non-publicly traded)	20% if not admitted to official listing, but expected to within a year	30%		40%	
Equity	50%	30%	40% - listed companies 10% (not listed, but allowed for public trading) 10% - NFI shares	no limit	30%		30%	50%
Private equity/ investment funds/mutual funds	50%		10% closed funds 15% open funds	no limit	30% (private equity not allowed)	20%		
Municipal bonds			15% publicly traded 5% others	no limit	30%			
Short-term bank deposits		40%	20%	no limit	15%		60% <sup>2</sup>	35%
Derivatives			only for hedging purposes	only in listed derivatives	30% for hedging purposes	not allowed	not allowed	10% only for risk management purposes
Real estate	5% direct investment 25% mortgage bonds 10% real estate investment units		not allowed	not allowed	not allowed	5%	not allowed	10%

<sup>1</sup> Bonds issued or guaranteed by the Republic of Macedonia or by the National Bank of the Republic of Macedonia.

<sup>2</sup> Bank deposits, certificates of deposits issued by banks and mortgage-backed securities issued by banks.

Source: Country sources and FIAP survey



**Table A N° 8**  
**LIMITS REGARDING CONCENTRATION**

Country	Single issuer	Ownership structure
Hungary	Maximum 10% in securities issued by the same issuer; Maximum of 20% in overall value of securities issued by an organisation belonging to the same banking group	No regulations
Kazakhstan	No regulation	No regulation
Poland	<i>Class of securities from a single issuer:</i> Maximum 10% of one issue of government-backed bonds; Maximum 5% deposited in one banks or 7.5% in case of dependent entities; 2% of assets in one investment fund (closed-end or mixed) 5% of assets in one open-end investment instrument; Maximum exposure to single issuer: 5% of assets	No regulations
Latvia	<i>Class of securities from a single issuer:</i> In equity - 5% Investment fund units - 5% Corporate debt securities - 10% Bank deposits - 10% <i>Maximum exposure to single issuer:</i> Governments and multinational financial institutions - 35% Banks - 15% Corporations - 10% Municipalities - 5%	Up to 5% of the share capital 10% of debt securities issued by one issuer 10% of the net assets of investment fund
Croatia	Max. 5% in a single issuer	No regulations
Bulgaria	Max. 5% in a single issuer 10% with specific permission by the Finance Supervision Commission	Up 10% of shares of one issuer Not exceeding the share that would allow to appoint directly or indirectly more than half of the members of the board or in another way to exercise control over decision-making activity of the issuer
Macedonia	The regulations allow the supervisory agency to specify the maximum proportion of any one company or asset and maximum proportion of assets, which may be held by a pension fund, with a prior opinion of the Securities and Exchange Commission of the Republic of Macedonia; the proposal is in a draft version	
Estonia	<i>Minimum diversification requirements:</i> Investment fund units - 5% Corporate debt securities - 5% Bank deposits - 5% Government institutions - 35% Real estate - 2%	No regulations

Source: Country sources and FIAP survey

**Table A N° 9**  
**LIMITS ON FOREIGN INVESTMENT**

Country	Per cent of assets that can be invested abroad
Hungary	30% of assets, of which 20% in non-OECD countries
Kazakhstan	up to 10% in the issues of international institutions, i.e. the World Bank.
Poland	5%, there are no specific limits by asset class.
Latvia	30% in non-matching currency, of which 10% in one non-matching currency
Croatia	15% of which up to 10% in foreign equity listed companies (rated A and above)
Bulgaria	not more than 5% of assets in foreign government securities and municipal bonds
Macedonia	no more than 20% of the value of assets may be invested in foreign securities; up to 5% may be invested in bonds, bills and other fixed income securities with a minimum investment grade level rating by reputable international rating agencies of non-state foreign companies or banks of an EU country, Japan or USA; up to 5% may be invested in shares and securities (or participation units) with minimum investment grade level rating by reputable international rating agencies traded on the primary stock exchange of an EU country, Japan or USA.
Estonia	<p>The assets of mandatory pension fund may be invested in foreign securities only if:</p> <ul style="list-style-type: none"> <li>– the securities are traded on a regulated securities market of a state which is Contracting Party of the EEA agreement;</li> <li>– the securities are traded on a regulated securities market of a state which is a member state of the International Organisation of Securities Commissions (IOSCO) and specified in the rules of articles of association of the corresponding fund.</li> </ul> <p>All investments must follow the limits regarding issuers and instruments. Limitations should be set across countries in fund rules if instruments to one foreign country exceed 30% of the fund NAV.</p>

Source: Country sources and FIAP survey

**Table A N° 10**  
**RESERVES ESTABLISHED BY PENSION FUNDS**

Country	Fund level	Industry level
Hungary	Separate funding reserves for the accumulation period and benefit reserves for payout period.	<p>Guarantee Fund, financed from mandatory guarantee fee of from 0.3% to 0.5% (currently 0.4%) of contributions.</p> <p>Payments can be effected from this fund in the following cases:</p> <p>if the claims of a fund member or a beneficiary of a member of the Guarantee Fund have been frozen in the case of a switch of funds, a return to the social security pension system, or the provision of pension payment benefits, or in the case of the death of the fund member,</p> <p>if the level of the benefit reserves hampers fulfilment of service obligations in the period of payment of pension benefits.</p>
Kazakhstan	Additional and principal reserve capital	no reserves
Poland	<p>Reserve fund holding not less than 1.5% of assets.</p> <p>Payments are made in case of supplementing the value of assets resulting from fraud or mismanagement as well as meeting deficiency resulting from lower rate of return than legal minimum.</p>	<p>Guarantee Fund at the level of 0.1% of assets.</p> <p>Payments are made in case of supplementing the value of assets resulting from fraud or mismanagement as well as meeting deficiency resulting from lower rate of return than legal minimum, after transfers from reserve fund and from share capital of PTE were made and managing PTE became bankrupt.</p> <p>The Guarantee Fund is backed up with state budget guarantee.</p>
Croatia	No special reserve, any liabilities of managers will be covered from the share capital	The minimum rate of return is backed up with state budget guarantee

*Table A N° 10 continued*

Country	Found level	Industry level
Latvia	1% of assets, not less than 50 000 lats	no reserves
Bulgaria	The pension insurance company shall be obliged to establish general reserves in accordance with the Commercial Law. The pension insurance company managing a universal pension fund shall necessarily establish a pension reserve under the terms and conditions determined by the Council of Ministers. The pension reserve shall cover payment of pensions to individuals who have lived longer than the preliminary actuarial projections.	no reserves.
Estonia	Pension fund managers are required to keep at least 1 per cent of assets of managed funds, financed from their own capital invested in the same portfolio as pension funds. In case of necessity to meet the deficiency of pension fund as a first instance PF's mandatory participation is used; secondly PF's own capital.	Pensions guarantee fund as a sub-fund of the Guarantee Fund, to which pension fund management companies are obliged to make quarterly contributions.  In case of PF bankruptcy or in case investment restrictions set by law or PF rules have been violated and loss generated as a result of that. As a third instance the Guarantee Fund covers the loss to scheme participants and the State has the right to guarantee a loan taken by the Guarantee Fund if needed. First EUR 10,000 are totally covered to investors and sums that are above it, in 90%.
Macedonia	No special reserves required	State budget compensates 80 per cent of the depletion. At later stage, if this is possible, the managing company makes a refund to the state budget

Source: Country sources and FIAP survey.

**Table A N° 11**  
**CUSTODIAN SERVICE PROVIDERS**

Country	Custodian requirements
Hungary	A financial institution as regulated by the law on financial institutions
Kazakhstan	Commercial banks serve as custodians to private segment of the pension system, and the National Bank of Kazakhstan serves as a custodian to the SAF.
Poland	The National Depository of Securities or banks with share capital exceeding 100 mln Euro with whom the asset manager has concluded a custodial agreement. The custodian shall not be a shareholder of the PTE, which manages the pension fund under custody.
Latvia	A legal entity complying with the criteria of the custodian specified by the Law on Investment Companies and with whom the asset manager has concluded a custodial agreement.
Croatia	Commercial bank, authorised by the pension supervision agency, Harena
Bulgaria	Commercial banks if they comply with the requirements set by the Bulgarian National Bank and by the Financial Supervision Commission
Macedonia	A bank holding a current banking licence issued by the National Bank of the Republic of Macedonia with a minimum capital of 20 mln Euro and not hold shares in the Pension Company managing the Pension Fund whose assets it holds or shares in an entity which is an Affiliated Person in relation to the Pension Company, and must not maintain any other capital relationship with those entities. In the event that the Pension Fund has assets outside the Republic of Macedonia the Custodian shall appoint another custodian body to keep those assets which shall be a bank holding a current banking license from a country other than Macedonia or a specialist depository institution and in either case such body must, if required by relevant law hold any necessary authorisations for such activity in any market where it acts as custodian of a Pension Fund. Any sub-custodian so appointed in respect of assets outside the Republic of Macedonia must have an investment grade rating by reputable international rating agencies. The Agency shall regulate in details the criteria for the rating of sub-custodian.
Estonia	Custodian services may be provided by institutions specified in the investment funds legislation. Only a custodian which is an account administrator and which has operated as the custodian of a contractual investment fund for at least one year during the three years preceding entry into the custodian contract may be the custodian of a mandatory pension fund.

Source: Country sources and FIAP survey

**Table A N° 12**  
**REGULATIONS REGARDING TRANSFERS BETWEEN FUNDS**

Country	Administrative limitations	Transfer fees
Hungary	Members may change the pension fund if they have been with their current fund for at least 6 months and the new fund must accept the application for membership.	The pension fund making the transfer to another fund may charge a fee of up to 0.1% of the transferred sum to the member.
Kazakhstan	Beneficiary of pension payments from a pension accumulation fund shall transfer his/her pension accumulations from one pension accumulation fund to another not more often than twice in a course of a calendar year	None
Poland	None	Maximum transfer fee specified in decree can range from 5 to 40 per cent of minimum salary (currently from 320 to 40 PLN). The limit depends on the length of affiliation in previous fund. Fees for individual funds are specified in the articles of association.
Latvia	Members have to chose only one Investment plan at the same time. They have a right to change asset manager during the participation period, but not more than once a year.	None
Croatia	None	5 percent of total accumulation in the first year of affiliation with a specific fund; 2.5 percent in the second; 1.25 percent in third; 0.625 percent in fourth; and 0.31 percent in the fifth year.
Bulgaria	No more than once a year, after at least a calendar year of affiliation	transfer fee cannot exceed two times the amount of the actual transfer cost
Estonia	Once a year, but only after 1 January 2005.	None
Macedonia	Not allowed during the first years of the system.	After that they can switch with a fee or without if they had been members of a Pension Fund for more than 2 years. The maximum size of the fee is a subject to a decree.

Source: Country sources and FIAP survey

**Table A N° 13**  
**ANNUITY PROVISIONS IN ECA COUNTRIES**

Country	Products	Providers	Life tables
Hungary	Individual life annuity; Joint life-annuity for a fixed period with a set beginning; Joint life-annuity for a fixed period with a set end; Joint survivorship annuity.	Pension funds (if have at least 25000 members) or insurance companies.	Unisex
Kazakhstan	Commercial insurers would provide pension payments for the funded system (fixed-term payments, single life annuities, joint and survivor annuities). Until the industry is established, however, lump-sum distributions will be the major source of financing.	Insurance companies, after the industry is established.	No regulation
Poland	Mandatory annuity (probably single and joint, with or without guarantee periods).	No regulation yet.	Unisex
Latvia	Social Security Administration: single annuities; Private providers: single annuities, joint annuities, deferrals, variable annuities.	Licensed life insurance companies or Social Security Administration (paid together with pay-as-you-go pension).	No specified life tables
Croatia	Mandatory annuity (single and joint, with or without guarantee periods), indexed to prices	Separate pension insurance companies.	Unisex
Bulgaria	Mandatory single annuity	Licensed pension or life insurance companies	Companies use their own mortality tables, approved by supervision.
Estonia	Mandatory annuity, programmed withdrawals in specific cases, lump-sums are allowed only in the case of small value of savings.	Licensed insurance companies that meet capital and investment requirements specified in the law	Unisex, promised interest rate not higher than 3%
Macedonia	Annuities or programmed withdrawal	no regulation yet	no regulation yet

Source: Country sources and FIAP survey

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# MACROECONOMIC EFFECTS OF PENSION REFORM IN CHILE<sup>1</sup>

VITTORIO CORBO<sup>2</sup>  
KLAUS SCHMIDT-HEBBEL<sup>3</sup>

## ABSTRACT

The Chilean pension reform of 1981 involved a gradual replacement of the traditional collective pay-as-you-go system managed by the state, with defined but uncertain benefits, by a fully-funded system managed by the private sector, with defined contributions but uncertain returns. Many countries have since implemented different versions of this revolutionary reform, but only Chile has accumulated more than two decades of post-reform experience, which support a full assessment of its results. This paper presents a comprehensive quantitative evaluation of the macroeconomic effects of the reform, including plausible ranges for the effects of the reform on the level and rate of GDP growth in 1981-2001. This study focuses on three main channels of the reform: saving and investment, labor markets (employment and labor productivity), and capital markets (and thus on total factor productivity). The main lesson from the Chilean experience is that a deep pension reform can contribute substantially to growth, through fiscal adjustment in response to the reform transition deficit, higher accumulation and utilization of factors of production, and factor productivity gains.

## 1. INTRODUCTION

Chile's adoption in 1981 of a mandatory fully-funded pension system managed by the private sector constituted a revolutionary

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<sup>2</sup> Ph.D. in Economics from the Massachusetts Institute of Technology (MIT). Professor at Pontificia Universidad Católica de Chile.

<sup>3</sup> Ph.D. in Economics from the Massachusetts Institute of Technology (MIT).

change from a traditional unfunded pay-as-you-go system that was managed by the state. Twenty-two years later, this reform remains a milestone in the development of pension systems around the world and has inspired changes in the same direction that have been applied to pension systems in dozens of countries.

A vast theoretical and empirical literature focuses on different aspects of pension systems and their reforms. Several factors have to be taken into account when assessing the economic effects of shifting from a pay-as-you-go to a fully-funded pension system (Lindbeck and Persson, 2002; Feldstein and Liebman, 2002). The first factor is the degree of pre-funding, that is, whether there is a reserve fund to back the liabilities of the system (the pension rights) and, particularly, whether pensions are financed mainly by taxing labor or if the pension system has a substantial actuarial (and cash) deficit, as was the case in Chile. The second is the extent of the connection between the pensions that workers expect and their contributions over their active working life. The closer the two latter are in present value, the smaller will be the labor market distortions. In the Chilean pay-as-you-go system, the relationship between contributions and pensions was weak for several reasons: the difference between the rate of return in capital markets and the growth rate of the wage mass (i.e., the return of the PAYG system), the payment of pension benefits based on pre-retirement wages (which discriminated against workers with flat income throughout their working lives), and the frequent changes in the regulations governing contributions and benefits. By contrast, in the fully-funded system based on individual pension accounts, accrued pensions are directly related to workers' contributions and market returns. The third factor involves the way in which the fiscal deficit caused by the transition from the old system to the new is financed.

Much research has analyzed partial aspects of the Chilean pension reform. Several papers analyze labor-related, financial, and microeconomic aspects of the reform (for example, Edwards and Cox Edwards, 2002; Valdés-Prieto, 2002; Lefort and Walker, 2001). Others estimate the effects of the reform on welfare and/or output (for example, Schmidt-Hebbel, 1998; Holzmann, 1997; Valdés-Prieto and Cifuentes, 1993; Arrau, 1991).

The macroeconomic and growth effects of a pension reform like the Chilean one manifest through three main channels: national

saving and domestic investment flows; aggregate employment, the share of formal employment, and labor productivity; and the development of capital markets (and its effect on total factor productivity, TFP). No earlier papers have, as yet, undertaken a comprehensive quantitative evaluation of the macroeconomic effects of the reform and their implications for the level and the rate of growth of GDP in Chile, through its effects on saving and investment, labor markets, and capital markets.

The aim of this paper is to carry out this evaluation. We start by analyzing the design features of the reform and the gradual evolution of the pension system thereafter, which determine the theoretical effects that this might have on macroeconomics and growth (section 2). We then analyze the reform's effects on the volume of domestic saving and investment and address the implications of the reform for factor markets. Section 4 analyzes how the reform has affected labor markets, while section 5 focuses on the effects on capital markets. In section 6 we use the results from the three preceding sections to estimate the reform effects on the level and rate of GDP growth, considering the impact on total factor productivity, employment, and the stock of capital in the economy. The paper ends with our main conclusions for the Chilean case and inferences for reform experiences in other countries.

Certain aspects of the reform are not covered in this paper. Among them are the characteristics of the first (distributive) pillar of the pension system, the regulation and supervision of pension funds and life insurance companies, the microeconomic aspects of the functioning of the pension fund and life insurance markets, the commissions structure and levels, and changes in risks and levels of welfare for different income groups and generations.

## **2. REFORM FEATURES AND THE DEVELOPMENT OF THE PENSION SYSTEM**

### **2.1. The scope of the pension reform**

The pension reform of May 1981 introduced radical changes to three fundamental aspects of the Chilean pension system: the design of the contribution scheme; the role of the state in the ownership, regulation, supervision, and guarantees of pension funds; and the transition toward the system's steady state. These

changes had consequences that must be taken into account when evaluating the effects of the reform.

### *2.1.1. The design of the contribution system*

- (i) Funding. The former pay-as-you-go system (with no pension assets) was replaced by a fully-funded system. The loss of contributions diverted into individual pension accounts involves a pension deficit for the government. Depending on how this deficit is financed, whether factor prices are affected, and whether people with low saving levels change their saving habits, the reform may affect domestic saving, domestic investment, and GDP during the transition and toward the new steady state. We discuss these effects in section 3 below.
- (ii) Actuarial fairness. The previous system, which was actuarially unfair, was replaced by an arrangement that links contributions directly with the present value of future pension benefits, discounted at the rate of return of pension investments. The old system implied a pure tax on employment, corresponding to the pension contribution rate times the difference between the market rate of return on savings and the expected rate of return from the pay-as-you-go pension system. The elimination or reduction of the pure tax on employment encourages aggregate employment and reduces the incentives for informal employment. The absolute contribution rate was also reduced with the reform, owing to the higher expected net rate of return with the new system. We discuss these effects in section 4 below.
- (iii) Changes in risk and risk sharing. The previous system of defined pension benefits was replaced by one whereby contributions are determined during the stage of pension asset accumulation (that is, working life). For the payout stage (that is, retirement), there are two options: a programmed withdrawal of the saved funds during retirement, with an uncertain return, and a life annuity, with defined benefits. During the active phase, therefore, and, also during the passive phase in the case of programmed withdrawal, the return risk (and longevity risk in the passive phase) is borne by the worker, whereas in the case of a life annuity, the return risk is borne by the insurance company over the passive phase. The new system thus introduced return risk for the contributor, instead of GDP risk (GDP growth determines the rate of return in a mature pay-as-you-go system, in a steady state with no political uncertainty). On the other hand, the reform

probably reduced the political risk of changes in the rules of the game. With explicit ownership rights on the savings held in the individual accounts, it is more difficult now for a government to change future pension benefits than under the old pay-as-you-go system, which underwent frequent changes in contributions and benefits. The new system has additional effects on the risk of those individuals covered by the first pillar and by the state guarantees on the second pillar, which will be discussed below. Finally, intergenerational risk sharing is lessened under the new system, due to the replacement of the intergenerational transfers under the pay-as-you-go system with a direct relationship between contributions and benefits at the individual level. Evaluating the effects of the changes in risk is complex, because it is difficult to measure and evaluate their impact on saving and aggregate employment. We do not consider these possible changes in risk and risk sharing in this study.

### *2.1.2. The role of the state*

The pension reform brought a radical change in the role of the state, which is evident in four main areas:

- (i) Complete replacement of the old system. The old system is being eliminated gradually but completely, with the exception of personnel in the armed forces and the police force. Consequently, when the new system reaches its steady state (upon the death of the last pensioner under the old system), all contributions and pension payments (except for the state guarantees, described below) will correspond to the new system. This marks a difference with other pension reforms (such as those in Argentina, Colombia, and Poland) that have adopted a mixed system for the steady state.
- (ii) Ownership. State ownership of the old pension agencies has been replaced with private ownership by specialized institutions, namely, the pension fund management companies (AFPs) and life insurance companies. State companies are not allowed to operate in the reformed system.
- (iii) State regulation and supervision. Effective state regulation and supervision of the AFPs and insurance companies is essential because this financial services sector owes its existence exclusively to mandatory legislation and the state has issued guarantees on pension investments and returns. Different models are available for

the provision, regulation, and supervision of the pension services of collecting contributions, maintaining information, investing the funds, and paying pension benefits. We do not analyze these different options, although they have vital implications for the industrial organization and efficiency of the sector.

- (iv) Government guarantees. The new pension system reinforces the role of the state in redistributing and providing pension insurance. The social pension for the destitute is “pillar zero” of the Chilean system. The first pillar is comprised by the government guarantee of provision of supplementary funds to complete a minimum pension for AFP contributors, together with guarantees on the AFPs’ rates of return and on the pension assets held by the AFPs and insurance companies. However, these state transfer and insurance programs take their toll on efficiency and welfare, because they alter the incentives for workers to save and participate in the pension system and for the AFPs to prudently manage their funds<sup>4</sup>.

### *2.1.3. The systemic transition*

The transition has the following features, with implications for the dynamic reform effects.

- (i) Speed. The system transition is very gradual. Everyone who belonged to the old system in 1981 was given the option of changing to the new system, while new members of the work force were forced to participate in the new system. This is different from the approaches of later reform experiences (such as in Bolivia and Mexico), in which the transition to the reformed system was instantaneous, with the closure of the old pension funds and the immediate transfer of all participants<sup>5</sup>. The gradual nature of the Chilean transition -under which contributions to the old pay-as-you-go system will continue for about 35 years and payments for about 65 years until the death of the last pensioner- means that the effects on saving and investment, factor markets, and growth will take much longer than under a fully instantaneous change.

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<sup>4</sup> See Mitchell and Zeldes (1997) on the disincentive of social and minimum pensions.

<sup>5</sup> Mexico features a reversibility option by which members who changed to the new system have the option of retiring under the old system by transferring their accrued funds to it.

- (ii) Recognition of old pension rights. One year before the transformation of the pension system, the pay-as-you-go system was reformed, with an important cut of net pension benefits. This significantly reduced the social security deficits and implicit debt of the pay-as-you-go system (Arrau, 1990). The 1981 reform did not introduce additional changes in pay-as-you-go pension benefits. It made them explicit by maintaining the pensions of people already retired or due to retire under the old system and it recognized the contributions of those participants who decided to shift to the new, whether at the time of the reform or later.
- (iii) Financing the transition deficit. The public sector incurred a long-range pension deficit when it recognized the pension rights of participants members of the old system while losing the contributions corresponding to members of the new system,. Due to the fungible nature of the revenue available to the government for covering all its expenses, including pensions, it is not possible to infer the financing method that was used to cover the transition deficit, which include a non-pension surplus, inflation tax, debt, or the sale of state assets. Therefore, we consider different alternatives for funding the deficit, which differ considerably in their macroeconomic implications.
- (iv) Changes in system characteristics. The 1981 reform effected a radical change in the Chilean pension system. Although its main features remain unaltered, various legal and regulatory changes have been introduced in the past two decades. Several aspects of the system are currently under public discussion and may give rise to future legal amendments, including the reform of the surviving pay-as-you-go plan for the armed forces and the police, the provision of incentives to encourage more self-employed and informal workers to join the system, the government and AFP guarantees on the rate of return, the state guarantee of a minimum pension, and other issues that may influence the management commissions paid by contributors to AFPs.

## 2.2. Development of the pension system, 1980-2002

Table 1 presents the main indicators for the pension system in Chile following the pension reform. The pension system has grown remarkably since the early 1980s. Pension fund assets increased from 0.8% of GDP in 1981 to 55.8% of GDP in 2002, yielding an annual average gross real return of 10.4% in the post-reform period (column 8). The number of contributors to the new



**Table N° 1**  
**MAIN INDICATORS OF THE PENSION**  
**SYSTEM IN CHILE, 1980-2002**

Year	AFP Contributors (% of work force) (1)	INP Contributors (% of work force) (2)	AFP Pensioners (% of work force) (3)	INP Pensioners (% of work force) (4)	Social security savings deficit (% of GDP) (5)
1980	-	61.5	-	24.2	-
1981	Nd	34.9	-	23.6	1.8
1982	28.0	15.0	0.1	25.9	3.1
1983	31.1	12.0	0.3	25.5	4.0
1984	33.6	11.6	0.5	25.4	4.0
1985	37.6	11.9	0.6	25.2	3.9
1986	41.6	11.2	0.8	24.5	3.5
1987	46.3	9.2	1.1	23.7	3.4
1988	47.4	8.5	1.2	22.3	3.1
1989	48.0	9.0	1.5	21.1	3.1
1990	54.8	8.4	1.8	20.7	3.4
1991	50.6	7.9	2.3	20.2	3.4
1992	53.3	7.4	2.6	19.5	3.2
1993	52.3	6.6	2.9	18.5	3.4
1994	52.7	5.9	3.4	18.1	3.3
1995	53.9	6.0	3.9	17.8	3.1
1996	56.5	5.6	4.3	17.8	3.3
1997	58.6	4.9	4.7	17.5	3.4
1998	54.9	4.7	5.1	17.2	3.6
1999	56.0	5.1	5.5	16.9	4.1
2000	54.7	4.8	6.2	16.9	4.0
2001	58.8		6.8		4.0
2002	57.9		7.3		3.9

Source: (1), (3), (7), (8) Superintendency of AFP.  
 (6) Bennett, Schmidt-Hebbel and Soto (1999) and author's calculations  
 (5) Bennett and Schmidt-Hebbel (2001)  
 (2), (4), (10) Central Bank  
 (9) INE (National Institute of Statistics)

<b>Flows of pension savings (% of GDP) (6)</b>	<b>Pension fund assets (% of GDP) (7)</b>	<b>Real gross rate of return on pension funds (%) (8)</b>	<b>Growth rate of real wages (%) (9)</b>	<b>Growth rate of GDP (%) (10)</b>
-	-	-	8.4	7.7
0.8	0.8	12.8	9.2	6.7
2.4	3.5	28.5	-0.2	-13.4
2.7	6.1	21.3	-10.6	-3.5
3.3	8.0	3.6	0.1	6.1
3.7	9.7	13.4	-4.3	3.5
3.3	11.5	12.3	2.1	5.6
3.9	12.9	5.4	-0.2	6.6
3.4	13.6	6.5	6.6	7.3
5.2	16.4	6.9	1.9	10.6
7.3	22.0	15.6	1.8	3.7
6.0	28.3	29.7	4.9	8.0
5.5	28.3	3.0	4.5	12.3
5.9	34.5	16.2	3.7	7.0
5.4	38.1	18.2	6.5	5.7
5.9	36.2	-2.5	4.8	10.6
5.6	37.4	3.5	4.1	7.4
5.2	39.0	4.7	2.4	6.6
5.2	40.3	-1.1	2.7	3.2
5.5	49.2	16.3	2.4	-0.8
5.6	51.0	4.4	1.4	4.2
4.9	53.6	6.7	1.6	3.1
n.a.	55.8	3.0	2.0	2.1

fully-funded system, which rose to 28% of the work force in the first eight months into the reform, doubled between 1982 and 2002, to 57.9% of the work force. Pensioners under the new system currently represent 7.3% of the work force. The growth in the number of contributors and pensioners under the new system also reflected in an average rate of mandatory pension saving of 4.6% of GDP for the post-reform period. At the same time, the number of contributors in the old pay-as-you-go system fell gradually from 61.5% of the work force in 1980 to 4.8% of the work force in 2000. The number of pensioners under the old system dropped from 24.2% to 16.9% of the work force over the same period.

### **2.3. Relation with other structural reforms**

The 1981 pension reform was part of a broad package of stabilization programs and structural reforms carried out between 1974 and 1981, deepened after 1985 and in the 1990s. Some of these policy changes complemented the pension reform, such as fiscal stabilization, labor market reforms, domestic and external financial liberalization, and various capital market reforms (see figure 7 for the development of financial and aggregate reform indicators). The complementary nature of these reforms makes it difficult to identify the separate contribution of each one. Moreover, their combined effects are most likely greater than the sum of their individual contributions to the growth and welfare of the country<sup>6</sup>. One must therefore be careful not to overestimate the contribution of any individual reform by failing to take into account other contemporary reforms with similar effects on the main variable of interest, namely, economic growth. When specifying and estimating the possible contributions of the pension reform, we thus give due consideration to the influence of other determinants, including the role of reforms carried out in other spheres.

## **3. DOMESTIC SAVING AND INVESTMENT**

Did the pension reform and its fiscal funding raise the rate of saving in the country during the period 1981-2001? If so, what fraction of the increased supply of loanable funds remained in the

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<sup>6</sup> Gallego and Loayza (2002) provide evidence of the importance of critical mass or interaction effects in the progress of the reforms, to explain growth worldwide and in Chile.

country, contributing to an increased investment rate? This section analyzes these two questions.

### 3.1. Domestic saving

Pension reform affects domestic saving through four channels: i) the change in the government's overall saving or surplus stemming from the transitional pension deficit caused by the reform and the fiscal response to that deficit, as reflected in the non-pension deficit; ii) the response of private saving to the change in total government saving; iii) the new mandatory pension saving by households in the AFPs; and iv) the response of voluntary saving by households to the mandatory pension saving. This section assesses the quantitative importance of each of these channels in the Chilean case.

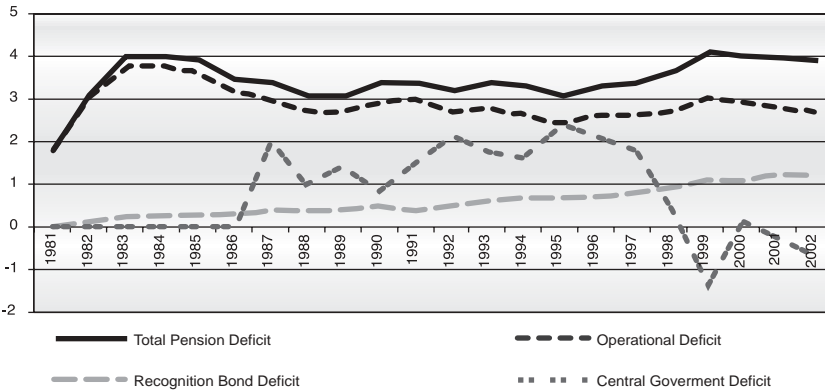
#### *3.1.1. Transitional deficit and overall government deficit*

The transitional deficit is made up of the operational deficit of the pay-as-you-go system and the deficit resulting from the recognition of debt with contributors to the pay-as-you-go system who shift the new system (the so-called recognition-bond deficit). The operational deficit is explained by the loss of contributions from members of the old pay-as-you-go system who joined the new system. The deficit from recognition bonds corresponds to the transfer of government resources to pensioners under the new system when they retire, in recognition of their historic contributions to the pay-as-you-go system.

Both deficits are, by nature, transitory. The operational deficit will end with the death of the last pensioner under the pay-as-you-go system, while the deficit associated with the recognition bonds will end with the retirement of the last member of the fully-funded system who made historic contributions to the pay-as-you-go system. The present value of the transitional deficits constitutes a measure of the implicit state debt of the old pay-as-you-go system, which is amortized throughout the period of transition. A gradual transition like the Chilean one may last for fifty years or more.

Figures for the operational and recognition deficits indicate that the annual value of the total transitional deficit peaked at 4.1% of GDP in 1999 (Bennett and Schmidt-Hebbel, 2001). Lower values are forecast for the future, with the deficit disappearing around the

**Figure N° 1**  
**SOCIAL SECURITY DEFICIT AND CENTRAL**  
**GOVERNMENT AGGREGATE 1981 - 2002**  
**(AS PERCENTAGE OF GDP)**



year 2040 (figure 1). The operational deficit peaked at 3.8% of GDP in 1983-1984 and the recognition bond deficit is forecast to reach a maximum of 1.3% of GDP between 2004 and 2008. The average value of the total deficit from the pension reform's transition for the period 1981-2001 was 3.4% of GDP.

How has the government financed the fiscal deficit of the reform? The fungible nature of available financial resources and their lack of correspondence with specific items of fiscal spending make it difficult to draw causal inferences between the pension deficit and a specific method of funding. An attempt to establish such a correspondence –tantamount to assigning causal relationships between specific sources and uses of the fiscal budget– is particularly difficult in the Chilean case, considering the great sensitivity of public finances to exogenous shocks and changes in structural policies<sup>7</sup>. We thus have no clear-cut way of determining how the transition of the reform was funded, even taking into account the existence of temporary taxes to

<sup>7</sup> For example, claiming that the pension reform was financed by non-pension surpluses is equivalent to saying that the changes in all other non-pension income and spending –for example, the costs of the banking crisis that coincided with the first four years of the pension reform and resulted in an cumulative value of 41.1% of GDP (Marshall and Schmidt-Hebbel, 1994)- were accommodated residually by an available combination of residual non-pension surplus, borrowing, and inflation tax.

provide partial funding and statements on the subject by the Minister of Finance of the period<sup>8</sup>.

Consequently, we assume different scenarios based on a wide range of funding options. We start with the extreme case, assuming full funding by fiscal adjustment; this is equivalent to financing 100% of the pension deficit by a non-pension surplus of the same size. This case represents the position of Valdés-Prieto (2002), who contends that the larger part of the transition was funded by increased non-pension fiscal saving. For the intermediate case, we assume 62.5% financed by fiscal adjustment, and for the case of a smaller fiscal adjustment, we use an increase in the non-pension surplus of only 25% of the pension deficit. We do not consider the opposite extreme where none of the deficit is financed through fiscal saving, as it is unlikely that a structural reform with such serious fiscal consequences would not give rise to at least some effort to restrict fiscal spending in the non-pension budget. The residual deficits not covered by fiscal adjustment (0%, 37.5%, or 75%, respectively) are funded by a combination of inflation tax, government borrowing, and the sale of state-owned assets.

Table 2 shows the possible effects of the pension reform on the overall government deficit, using the three alternative assumptions for total or partial funding by non-pension fiscal adjustment. The change in government saving owing to the pension reform lies within a range of between 0% (when the non-pension fiscal adjustment is 100%) and -2.55% of GDP (when the fiscal adjustment is 25%). For the intermediate fiscal contraction (62.5%), the change in government saving is -1.28% of GDP.

### *3.1.2. Response of the private sector to an increased government deficit*

Whether the private sector modifies its saving behavior in response to reduced public saving depends on at least two factors. The first involves the relationship between the transition pension deficit and

<sup>8</sup> A transitory tax was placed on labor, paid by the employer (at a rate of 3% in 1981, decreasing linearly to 0% in 1984). The stated aim of this tax was to cover some of the transitional deficit—certainly a small part, considering that the total cost is almost 100% of GDP. The former minister of finance stated, “From the economic point of view, what the Chilean government did was create private saving and more than neutralize the increased fiscal deficit by restricting government spending” (Büchi, 1993).

**Table N° 2**  
**EFFECTS OF THE PENSION REFORM ON**  
**DOMESTIC SAVING AND INVESTMENT**

Reform effect		Fiscal Adjustment 100%	Fiscal Adjustment 62.5%	Fiscal Adjustment 25%
Increase in total public deficit		3.4 - 3.4 = 0	0.625*3.4 - 3.4 = -1.28	0.25*3.4 - 3.4 = -2.55
Increase in mandatory (household) saving		4.6	4.6	4.6
Increase in private voluntary saving as response to:				
i) Public deficit (partial compensation)		0*(-0.36)=0	(-1.28)*(-0.36)=0.46	(-2.55)*(-0.36)=0.92
		0*(-0.47)=0	(-1.28)*(-0.47)=0.6	(-2.55)*(-0.47)=1.2
		0*(-0.57)=0	(-1.28)*(-0.57)=0.73	(-2.55)*(-0.57)=1.45
ii) Compulsory saving (partial or no compensation)		4.6*0=0	4.6*0=0	4.6*0=0
		4.6*(-0.36)=-1.66	4.6*(-0.36)=-1.66	4.6*(-0.36)=-1.66
		4.6*(-0.5)=-2.3	4.6*(-0.5)=-2.3	4.6*(-0.5)=-2.3
Increase in domestic saving explained by the pension reform	Maximum	0+4.6+0+0=	-1.28+4.6+0.73+0=	-2.55+4.6+1.45+0=
		<b>4.60</b>	<b>4.05</b>	<b>3.50</b>
	Intermediate	0+4.6+0-1.66=	-1.28+4.6+0.6-1.66=	-2.55+4.6+1.2-1.66=
		<b>2.94</b>	<b>2.66</b>	<b>1.59</b>
	Minimum	0+4.6+0-2.3=	-1.28+4.6+0.46-2.3=	-2.55+4.6+0.92-2.3=
		<b>2.30</b>	<b>1.48</b>	<b>0.67</b>
Increase in investment due to increased domestic saving explained by the pension reform	Maximum	4.6*0.6=2.76	4.05*0.6=2.43	3.5*0.6=2.1
	Intermediate	2.94*0.51=1.5	2.26*0.51=1.16	1.59*0.51=0.81
	Minimum	2.3*0.42=0.97	1.48*0.42=0.63	0.67*0.42=0.28

the amortization of the implicit public debt of the pay-as-you-go system. If the private sector fully acknowledges the fiscal position—that is, if the private sector considers all implicit and contingent government liabilities in its fiscal evaluation—then it will understand that a pension deficit that is financed, for example, entirely by issuing new public debt, is equivalent to swapping the implicit debt of the pay-as-you-go system for explicit government debt<sup>9</sup>. In this case the private sector does not alter its consumption levels, but offsets the increased public deficit with increased private saving.

The second factor is the planning horizon of consumers. If we assume an infinite planning horizon under a number of additional

<sup>9</sup> This neutrality is broken if one considers realistically that the market value of the explicit debt exceeds the value of the implicit debt, because of the difference in the rates of return (the interest rate of the explicit debt and the growth rate of the economy), in the context of consumers who are planning for a finite horizon.

assumptions (Seater, 1993), private saving behavior satisfies the Ricardian equivalence proposition (Barro, 1974). It responds to a change in public saving by adjusting its saving level in the same amount, with the opposite sign. If the private sector has a finite planning horizon, however, the funding of the reform by means of fiscal adjustment falls on the generations who bear the weight of the adjustment, who pay larger general taxes or suffer cuts in public spending during the transition period. Consequently, they do not increase their saving to fully compensate for the lower public saving. Their reaction depends on their burden of the public deficit, which in turn depends on the extension of the transitional deficit. Post-transition generations benefit from the complete amortization of the implicit debt by the previous generations: future generations do not pay taxes in the form of contributions to the pay-as-you-go system. Their levels of net income and saving are therefore higher<sup>10</sup>.

To empirically evaluate the effects of the overall public deficit caused by the reform, we use recent results in Bennett, Loayza, and Schmidt-Hebbel (2001) on the saving behavior of Chilean households and firms. The coefficients of the response of voluntary saving to government saving, as estimated by these authors for different econometric specifications, vary between -0.36 and -0.57. These values are significantly different from zero (the extreme case of no compensation) and from -1.0 (the extreme opposite of Ricardian equivalence)<sup>11</sup>.

Here we use these two estimated coefficients to define a plausible range and an intermediate coefficient (-0.47) to evaluate the voluntary saving response of households (and therefore of private saving) to the change in public saving. This response is obtained by multiplying the response or compensation coefficient by the increase in the public deficit stemming from the pension reform. The results, which are shown in table 2, range from no increase in voluntary saving when the fiscal adjustment is 100%, to 1.45% of

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<sup>10</sup> This implication of models of overlapping generations with a finite horizon has been known since the classic theoretical models of Samuelson (1958) and Diamond (1965), extended for empirical applications by Auerbach and Kotlikoff (1987). The huge amount of later literature includes applications for Chile by Arrau (1991), Valdés-Prieto (1997), and Valdés-Prieto and Cifuentes (1993).

<sup>11</sup> These estimated values for Chile are similar to the estimated coefficients for panel samples for Latin America (for example, Corbo and Schmidt-Hebbel, 1991) and for the world (Loayza, Schmidt-Hebbel, and Servén, 2000b).



GDP when the fiscal adjustment is 25% and the compensation coefficient is at its highest level (-0.57).

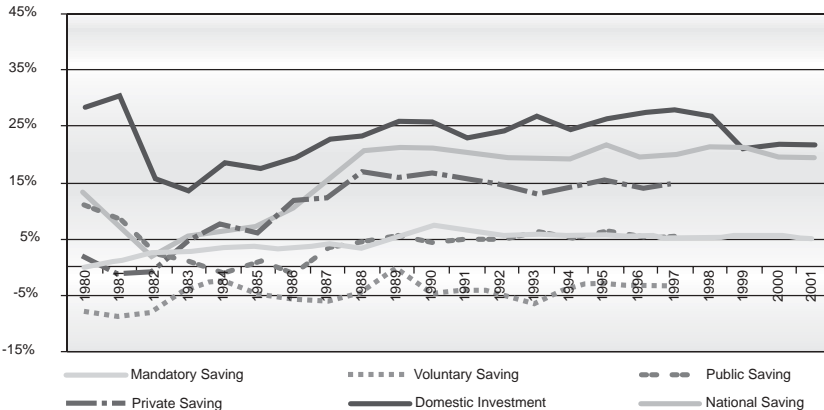
### 3.1.3. New mandatory household pension saving

The new fully-funded system generates a flow of mandatory contributions into the pension funds. We obtain a simple measure of the flow of mandatory household savings in the new pension system by adding the yield on the capital accumulated in the AFPs and insurance companies to these contributions and deducting the payments in pensions and capital gains. Figure 2 presents estimates of mandatory pension saving flows in Chile and of the flows of voluntary savings from households, firms, government, and the external sector, based on Bennett, Schmidt-Hebbel, and Soto (1999) and extended to cover the last few years. Compulsory household saving, initiated in 1981, reached a maximum value of 7.2% of GDP in 1990, with an average rate of 4.6% of GDP for the entire 1981-2001 period (as shown in table 2). Average voluntary household saving was negative, equal to -4.5% of GDP in the period 1981-1997, with a slight upward trend.

### 3.1.4. Response of households to the new mandatory pension savings

Households may have reacted to the obligation to save for their old age in pension funds by reducing their voluntary saving.

**Figure N° 2**  
**SECTORIAL SAVING AND INVESTMENT, 1980-2001**  
(AS PERCENTAGE OF GDP)



Theory outlines the conditions that have to be fulfilled in order for mandatory saving to be fully offset by a drop in voluntary saving, thus leaving total private saving unchanged. These conditions are the complete absence of myopia, borrowing constraints, as well as having consumption levels well above subsistence, together with other conditions that mean that mandatory saving is not a perfect substitute for voluntary household saving.

Many empirical studies for the world and for Chile reject the above conditions<sup>12</sup>. Many young or poor households spend their savings, or do not save or dissave large amounts. They exhibit a high subjective discount rate (myopia) and cannot borrow because they lack collateral acceptable in financial markets. This means that at the level of many individual households, as well as at the level of aggregate saving, mandatory saving is not -or is only partially -offset nullified by lower voluntary saving.

Bennett, Loayza, and Schmidt-Hebbel (2001) estimate the offset coefficient for voluntary saving in the face of a change in mandatory saving. For the series of voluntary and mandatory saving presented in figure 2, the authors obtain an offset coefficient of -0.36, which is not significantly different from zero at the 5% level. When they alter the conventional measurement of household saving by adding expenditures on durable consumer goods, they obtain estimates for the offset coefficient of around -0.80, which are statistically significant. These results suggest that at the aggregate level, households mainly reduce their consumption of durable goods and slightly reduce their saving levels, measured conventionally, in reaction to the obligation to save for retirement.

In the light of these results, we chose two values for the offset coefficient for voluntary saving (a measurement that excludes saving in durable goods): 0 and 0.5. Thus, the change in voluntary saving resulting from the increase in mandatory saving is obtained by the product of the offset coefficient by the increase in mandatory saving, which ranges from 0 when the offset coefficient is zero to -2.3% of GDP when the latter is -0.5 (see table 2).

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<sup>12</sup> Loayza, Schmidt-Hebbel, and Servén (2000b) present new international empirical evidence on these restrictions; a review of the literature can be found in Loayza, Schmidt-Hebbel, and Servén (2000a). Various chapters of Morandé and Vergara (2001) contain new relevant evidence for the Chilean case.

### *3.1.5. Total effect on domestic saving*

We obtain the pension reform's total effect on domestic saving by taking the sum of its effects on the four components of domestic saving (table 2). When we combine the ranges given for the parameters, the average response of the domestic saving rate for the period 1981-2001 ranges from 0.67% of GDP (when fiscal contraction is 25%, the offset coefficient for voluntary saving to changes in public saving is -0.36%, and the offset coefficient for voluntary saving to increased mandatory saving is -0.5%) to 4.6% of GDP (when fiscal contraction is 100%, the offset to public saving is -0.57%, and the offset coefficient to mandatory saving is zero). The intermediate values for increases in domestic saving, which result from combining different scenarios of fiscal adjustment with alternative parameters, are also reported in table 2.

## **3.2. Domestic investment**

In a country that is fully integrated in international financial markets and issues liabilities that are perfect substitutes for international assets, the real domestic interest rate (adjusted by the expected devaluation of the real exchange rate) is equal to the real international interest rate. Under such conditions, domestic saving and domestic investment are independent of each other. An increase in domestic saving, caused by a variable that does not affect investment, is reflected in an equivalent decrease in external saving, with no effect on the country's investment. The opposite case is that of a country in a state of complete financial autarchy (with no external savings), in which an increase in saving leads to more investment, by way of a reduction in the domestic interest rate.

International evidence shows that the predominant case is an intermediate one: there is financial integration, but it is not perfect, because of idiosyncratic national risks (sovereign or exchange rate risk and the risk of shocks associated to the country's structure of production, prices, and portfolio). Ample international evidence supports the existence of a correlation between domestic saving rates and domestic investment rates, from the classic study by Feldstein and Horioka (1980) onwards<sup>13</sup>.

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<sup>13</sup> This study of a cross-section of member countries of the Organization for Economic Cooperation and Development (OECD) shows a coefficient of 0.80 on a simple regression for the investment rate as a function of the domestic savings rate. Recent

To determine the possible effect on domestic investment of the change in domestic saving deriving from the pension reform, we estimated a simple equation for Chile, taking the following specification from Feldstein and Horioka<sup>14</sup>:

$$\frac{\text{Investment}}{\text{GDP}} = \alpha_0 + \alpha_1 \frac{\text{saving}}{\text{GDP}}$$

This equation was estimated for the period 1960-2001; the results are presented in table 3. The point estimate for the coefficient  $\alpha_1$  is 0.51, with a standard error of 0.089 and a high statistical significance<sup>15</sup>. Estimates based on a moving window of twenty-year sub-samples, beginning with 1960-1980 and ending with 1981-2001, show that the saving/investment coefficient fell from nearly 0.99 in the 1960s and 1970s to 0.4 in the 1980s and 1990s. This result is consistent with Chile's international financial liberalization Chile, which began in the 1970s.

We chose the central value estimated for the whole period (0.51) and the range given by the standard deviation of the point estimate (0.42 to 0.60). The range thus includes a value close to 0.40, which is the estimated coefficient for the period following pension reform (1982-2001). The increase in the investment rate, resulting from the increase in the saving rate that can be attributed to the pension reform, ranges from a minimum of 0.28% of GDP (when the increase in saving stemming from the pension reform is at its minimum and the saving-investment coefficient is 0.42) and a maximum of 2.76% of GDP (when the increase in saving is 4.6% of GDP and the saving-investment coefficient is 0.6). It is possible to obtain an intermediate value consistent with a 62.5% financing of the pension deficit through an increased non-pension government surplus, with private saving offset coefficients of 0.47 with respect to public saving and 0.36 with respect to mandatory saving, and with a saving-investment coefficient of 0.51. Under the latter parameters, the point estimate of the contribution of the

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evidence from Calderón and Schmidt-Hebbel (2003) for a world panel confirms the correlation between the two rates for different regional samples.

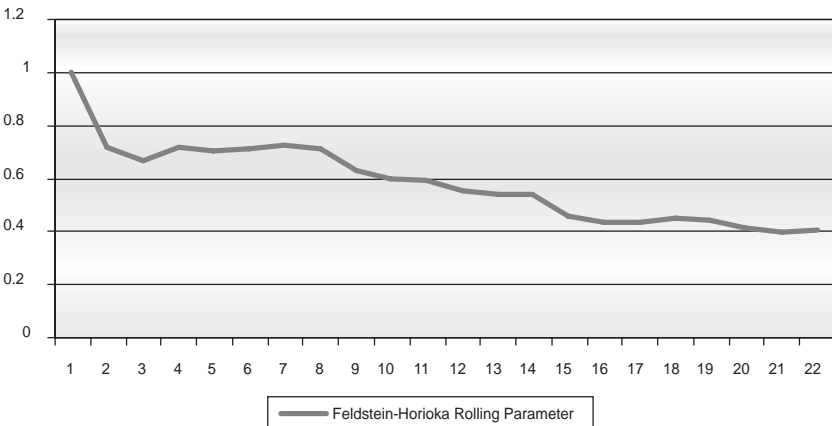
<sup>14</sup> Although this equation is used to make a causal inference on the pension reform's effects on investment through saving, this simple equation reflects a statistical relation between the two aggregates, rather than a causal relationship.

<sup>15</sup> In the same equation one cannot reject the cointegration hypothesis at 5% significance (McKinnon values).

**Table N° 3**  
**ESTIMATE OF THE RELATION BETWEEN DOMESTIC**  
**INVESTMENT AND THE DOMESTIC SAVINGS RATE, 1960-2001**

<b>Dependent Variable: Investment/GDP</b>				
<b>Sample: 1960 2001</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-Statistic</b>	<b>Probability</b>
Constant	0.147913	0.013158	11.24123	0.0000
Saving/GDP	0.511573	0.088560	5.776548	0.0000
<b>Summary Statistic</b>				
R-squared	0.454807			
Adjusted R-squared	0.441177			
S.E. of regression	0.031930			
Durbin-Watson stat	1.271396			
Akaike information criterion	-4.004121			
Schwarz criterion	-3.921375			
F statistic	33.36851			
Prob. (F. statistic)	0.000001			

**Figure N° 3**  
**ROLLING ESTIMATE OF THE**  
**SAVING-INVESTMENT PARAMETER( $\alpha_1$ )**  
(SAMPLES BASED ON TWENTY - YEAR OBSERVATIONS, 1960-2001)



pension reform and its fiscal response is an average increase of 2.3% of GDP in the domestic saving rate and 1.2% of GDP in the domestic investment rate for the period 1981-2002.

How much of the major rise in saving and investment that has occurred in Chile since the mid-1980s can be attributed to pension reform? Table 4 reports the rates before and after the reform, the corresponding shifts, and the contribution of the pension reform that we have estimated in this section. The data show that the domestic saving rate rose by 4.9% of GDP after 1981 or 9.0% of GDP after 1986, the first of a dozen “golden years” of high growth in Chile. The latter increases can be compared with the average contribution of the pension reform in 1981-2001, estimated to range from 0.7% to 4.6% of GDP, with an intermediate value of 2.3% of GDP. The domestic investment rate increased by 2.1% of GDP after 1981 or by 3.7% of GDP after 1986. The average contribution of the pension reform in 1981-2001 is estimated between 0.3% and 2.8% of GDP, with an intermediate value of 1.2% of GDP.

**Table N° 4**  
**SHARE OF INCREASED DOMESTIC SAVING AND INVESTMENT**  
**ATTRIBUTABLE TO THE PENSION REFORM, 1960-2001**

Variable	1960-2001	1981-2001	Change from 1960-1980 to 1981-2001	Change from 1960-1985 to 1986-2001
1.1 Domestic Saving (% GDP)	11.5%	16.4%	4.9%	9.0%
1.2 Increase attributable to the pension reform:				
• Estimate range			0.7%-4.6%	0.7%-4.6%
• Intermediate point estimate			2.3%	2.3%
2.1 Domestic investment (% GDP)	20.6%	22.7%	2.1%	3.7%
2.2 Increase attributable to the pension reform:				
• Estimate range			0.3%-2.8%	0.3%-2.8%
• Intermediate point estimate			1.2%	1.2%

In sum, the pension reform and its fiscal financing contributed significantly to higher saving and investment rates in Chile.

## **4. LABOR MARKETS**

This section examines the effect of the pension reform on total employment and its composition, together with its impact on workers' wages and average labor productivity. We start by analyzing the effects on employment and related variables resulting from the change in pure tax. We then examine the effects on average labor productivity and finally concentrate on the effects on employment of the increased labor participation of older workers.

The pension system reform has two potential effects on the level and composition of employment in the economy. The first depends on whether the reform changes the link between workers' contributions to the pension system and the value that such workers expect of their future pension benefits. The second depends on whether the reform alters retirement incentives.

### **4.1. Total employment and the formal-informal composition of employment**

In a pay-as-you-go system, the link between present social security contributions and expected future pension benefits is usually weak. This is reflected in a pure tax on employment, which is implicit and equals the pension contribution rate times the difference between the market rate of return on savings and the rate of return expected by workers. The reform may eliminate –or at least reduce– the pure tax on employment. This reduction is fostered by the lowering of the pension contribution rate that accompanied the reform (from roughly 26% to 11% of taxable wages), justified at least in part by the higher expected rate of return under the new system. The reduction in the pure tax on employment (in the formal sector) has three potential effects on labor markets: i) higher formal employment; ii) a larger supply of total labor, in response to the increase in the valued labor compensation in the formal and informal sectors (resulting from the reduced informal labor supply and the increase in the valued labor compensation in the formal sector); and iii) an increase in total employment, a reduction in structural unemployment, and an

increase in aggregate productivity (if the formal sector is more productive than the informal sector).

To quantify the latter effects of the reform, we construct a two-sector (formal and informal) model for labor markets. It is based on Edwards and Cox Edwards (2000, 2002), who use it to estimate the effects of the Chilean pension reform on labor markets<sup>16</sup>. We extend their model in three directions. First, we consider the effect of a change in the pure tax on employment on the net wage and the subsequent effect that this has on the total labor supply. Then we incorporate the effect of the possibility of becoming unemployed on the total labor supply. Finally, we estimate the pure tax on contributions in the old pay-as-you-go system at a value below 100%.

This extended model reflects three structural features that may be affected by the reform. First, the formal sector complies with labor legislation, while the informal sector evades or eludes it, including the requirement to pay contributions to the pension system. Second, inflexibilities in the formal sector keep wages above equilibrium, whereas equilibrium wages and employment in the informal sector react to excess supply of labor in the formal sector<sup>17</sup>. The wage differential between the two sectors leads to unemployment, explained by the fraction of the work force that will rather not be employed in the informal sector in order to search for a formal-sector job. Third, total labor supply is elastic to wages.

The following effects of the pension reform may be derived from the model presented in appendix 2. The reduction in the pure tax from the contribution to the pension system reduces gross wage and raises the net wage in the formal sector. It increases employment in the formal sector, determined by the demand for labor. The wage in the informal sector increases, because the increase in the expected value of the wage in the formal sector (stemming from a rise in both the wage and the likelihood of finding work in that sector) reduces the labor supply in the

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<sup>16</sup> Both are based on the classic model of Harris and Todaro (1970), which models the relationship between the formal and informal sectors based on the relationship between formal and informal wages, as determined by the unemployment rate.

<sup>17</sup> Examples of formal sector inflexibility include the minimum wage, efficiency wages, and wages above equilibrium, in keeping with bargaining or job-search models.



informal sector. The higher expected wage increases the total supply of labor, which reduces wages in both the informal and the formal sectors (gross and net) and increases employment. The prices of products sold in the informal sector increase, which to some extent offsets the effects on the labor supply.

Simulating the model requires estimating the pure tax element of the contributions under the old and the new system. The reform introduced a substantial reduction in the total rate of social security contribution, from an average of 26% of the wage under the pay-as-you-go system to about 11% under the fully-funded system. For the reformed system, Edwards and Cox Edwards (2002) estimate the pure tax component at 5.6% of the gross wage, that is, about 50% of the contribution; this value is very similar to that suggested by Torche and Wagner (1997)<sup>18</sup>. For the old system, Edwards and Cox Edwards use 100% of the contribution rate of 26% of the gross wage. We believe this assumption is extreme, and we therefore estimate three alternative values of less than 100%, based on the following methodology.

In a pay-as-you-go pension system that is financially balanced and in steady state, both systemically and demographically, the social security contributions (and therefore the pensions paid) grow at a rate  $g$  (the growth rate of the economy). This is the rate of return of the pay-as-you-go system, without allowing for economic uncertainty and risks related to the rules of the game in that system. Under a fully-funded system with defined contributions, the rate of return on the contributions is equal to the net rate of return of the pension funds' portfolio ( $r$ ). If we assume the absence of systemic, economic, demographic, and financial risks (and their effects on the rates of return of both systems) and the absence of myopia and credit restrictions (such that the market interest rate is the relevant factor for discounting future pensions), then the pure tax rate may be expressed as a function of the difference between the GDP growth rate and the rate of return on capital. Before we can transform the above annual rates into relevant rates for the average contribution period, this latter period must be defined ( $n$ ).

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<sup>18</sup> In these papers the amount of pure tax in the new system is determined using a wage equation. The difference between the wages paid in the sector that contributes to the system and the wages paid in the sector that does not contribute to the system, controlling for other variables that determine wage differences, corresponds to the estimated pure tax component.

We can then calculate the implicit tax in a pay-as-you-go system, as follows:

$$t = 1 - \frac{[1 + g]^n}{[1 + r]}$$

The average contribution period,  $n$ , was estimated to be twenty-five years. We used the average values observed in the post-reform period (1981-2001) to create the parameters for the rates of growth and return<sup>19</sup>. The average GDP growth rate was 4.6%. For the relevant rate of return, we used three measurements: the real average bank interest rate for the period (13%), the average marginal productivity of capital in the period (14.3%), and the average net rate of return of the new pension system (8.4%)<sup>20</sup>.

On this basis, we used three pure tax rates from the old system in simulating the model. The first pure tax rate is 59% of contributions (15% of the gross wage), calculated using the net rate of return of the new system, which we believe to be the most appropriate measurement. The second rate is 85% of the contributions, a value close to those determined by the other two measurements for yield. This higher value may be justified if one considers two factors that increase the pure tax rate under the old system: the possibility that the risk of the pay-as-you-go system may be higher than the return risk of the new system, and the existence of workers with above-market discount rates (which is precisely what leads to a significant pure tax under the new system). Finally, for the third pure tax rate, we take the average of the previous two rates. Almost all the other parameters in the model are the ones used by Edwards and Cox Edwards<sup>21</sup>. Table 5 summarizes the model's assumptions.

The results of the simulations are shown in table 6, together with the results reported by Edwards and Cox Edwards (2002) for two

<sup>19</sup> The calculations change in magnitude when another period is used. We believe that this is the correct period, however, because it is the longest possible post-reform period and therefore minimizes the cyclical effects on average rates.

<sup>20</sup> For this rate an adjustment of 2% on gross yield was assumed for expenses and administration deductions.

<sup>21</sup> The exception is wage-unemployment elasticity, which is not part of the Edwards and Cox Edwards model. García (1995) estimates a wage equation -using variables  $I(0)$ - with quarterly variables for the period 1980:3 to 1994:2. He finds a real target wage elasticity with respect to unemployment of -0.186, where the real target wage is the fixed wage over the proportion of contracts that are renegotiated in each period.

**Table N° 5**  
**PARAMETERS USED TO SIMULATE**  
**THE LABOR MARKETS MODEL**

Parameters	Case 1	Case 2	
Work Force	3.7	3.7	
Employment in the formal sector	1.85	1.85	
Employment in the informal sector	1.45	1.45	
Unemployment	400	400	
Transfer of prices to wages in the informal market	0.3	0.5	
Elasticity of labor supply in relation to the expected wage level	0.3	0.3	
Weight of the informal sector price level on the price level	0.3	0.3	
Elasticity of labor demand in relation to the informal sector wage level	-0.7	-0.5	
Elasticity of labor demand in relation to the formal sector wage level	-0.4	-0.6	
Initial tax component of the pension system	0.26	0.26	
Final tax component of the pension system	0.056	0.056	
Elasticity of the formal wage in relation to the level of unemployment	-0.186	-0.186	
<b>Pure tax rate of pension system (% of the gross wage)</b>			
	Case 1	Case 2	Case 3
Old System	15	22	19
New System	5.6	5.6	5.6

Source: Edwards and Cox Edwards (2002), García (1995) and author's calculations.

**Table N° 6**  
**ESTIMATED EFFECTS OF THE PENSION**  
**REFORM ON EMPLOYMENT AND WAGES**  
**(IN PERCENT)**

	59% implicit tax		72% implicit tax		85% implicit tax		Edwards and Cox Edwards 2002	
Variable	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2
Total Employment	1.3%	2.3%	1.8%	3.0%	2.1%	3.7%		
Formal Employment	3.2%	4.7%	4.2%	6.2%	5.2%	7.6%		
Informal Employment	-1.1%	-0.8%	-1.4%	-1.1%	-1.7%	-1.3%		
Change in Unemployment Rate	-0.7%	-1.3%	-0.9%	-1.7%	-1.1%	-2.0%	-1.5%	-2.1%
Gross Formal Wage	-8.0%	-7.8%	-10.6%	-10.3%	-13.0%	-12.6%		
Net Formal Wage	0.3%	0.6%	0.4%	0.7%	0.5%	0.9%		
Informal Wage	2.2%	3.2%	2.9%	4.3%	3.5%	5.3%	3.8%	4.6%
Work Force	0.6%	0.8%	0.8%	1.1%	1.0%	1.3%		

sets of assumptions on parameters and three alternative values for the pure tax rate in the old system<sup>22</sup>. Case 1, unlike case 2, is based on assumptions for elasticity of demand in the two sectors and elasticity of the transfer from wages to prices in the informal sector, which imply fewer employment effects. Our results show that the effect of the pension reform on total employment in the economy ranges from 1.3% to 3.7%. There is also an important effect on the formalization of labor: formal sector employment expands by 3.2% to 7.6%, while informal employment contracts by 1.1% to 1.3%. The flow of workers from the informal to the formal sector is greater in this latter range, because the reduction in informal employment stemming from the formalization of employment is partially offset by an increase in employment in this sector, owing to the growth of the work force.

The increased employment caused by the reform, as estimated here, is reflected in an increase in output, which we quantify in section 6.2.

<sup>22</sup> The authors only report the change in the unemployment rate and the change in the informal wage (they report employment results only for a simplified model).

## 4.2. Average labor productivity

The increase in output may reflect not only greater aggregate employment, but also a rise in average labor productivity owing to the reallocation of workers among sectors. To measure this latter effect on output, we need to differentiate between the three flows of workers that occur in response to wage changes and the probability of finding formal employment: the unemployed and economically non-active who find work in the formal sector; the economically non-active who find work in the informal sector; and workers who migrate from the informal to the formal sector.

In an extended post-reform horizon (1981-2001) in which the transfer of active workers from the old system to the new is almost complete, workers entering the formal sector will not only increase their productivity by using more capital or operating in a better working environment (with increased total factor productivity), but also acquire the average human capital in the sector. We can therefore calculate the output gains deriving from the increase in the average productivity of workers resulting from their transfer, as the product of the number of transferred workers and the corresponding gain in productivity between the two sectors, weighted by the share of labor in output. Thus the output gain from the non-active population that enters the formal sector is the difference in productivity between the formal and the non-active sectors, and the output gain from the worker who changes from the informal to the formal sector is the difference in productivity between the two sectors, after weighting the gains by the share of labor in output.

Table 7 shows the estimated effects on the level of GDP in 2002, consistent with the above method<sup>23</sup>. Four alternative estimates are given, consistent with the following variants: the two cases corresponding to different elasticities in the labor model and two

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<sup>23</sup> For further details on the methodology used, see appendix 3; to express the results in terms of GDP for 2001, see appendix 6. The calculation presented here only includes the output gain from the individual effect of the reform on average labor productivity and does not include effects of the interaction between this and other individual effects of the reform (which are analyzed in section 6.2). The calculations made in section 6.2 include these interaction effects, so the results reported in that section are greater than those calculated here. For more details, see appendix 6.

**Table N° 7**  
**ESTIMATED EFFECTS OF THE PENSION REFORM ON GDP**  
**THROUGH CHANGES IN LABOR PRODUCTIVITY**  
**(IN PERCENT OF GDP IN 2001)**

Out put gain				
Case 1			Case 2	
Reform effect	Total informal sector	Informal sector excluding agricultural	Total informal sector	Informal sector excluding agricultural
Reduction in informal employment	0.07%	0.03%	0.09%	0.04%
Increase in total employment	0.08%	0.08%	0.23%	0.23%
Total	0.15%	0.11%	0.32%	0.27%

cases including and excluding the agricultural sector in the informal sector. We conclude that the increase owing to migration from informal to formal employment is in the range of 0.03% to 0.09% of GDP while that stemming from the net increase in employment is from 0.08% to 0.23% of GDP. Thus, the total effect of the pension reform on labor productivity in the economy, exclusively as a result of the reallocation of labor among sectors, is from 0.11% to 0.32%.

**4.3.Effects of the change in retirement incentives on employment**

The pension reform also has a potential effect on employment, by altering retirement incentives. Economic theory suggests that life expectancy and cyclical factors are among the causes determining the age of retirement. The pension plan can also affect the age at which individuals retire. Under a system of defined benefits, it is costly for workers to prolong their working life beyond the year in which they become entitled to their pension, the amount of which is determined by the wages obtained over the last few years, because it means sacrificing the pension. By contrast, in the defined contribution plans, an extra year's work can mean an increase in the present value of the pensions received once a worker retires. It is for this reason that the pension system reform has a potentially positive effect on extending the participation of

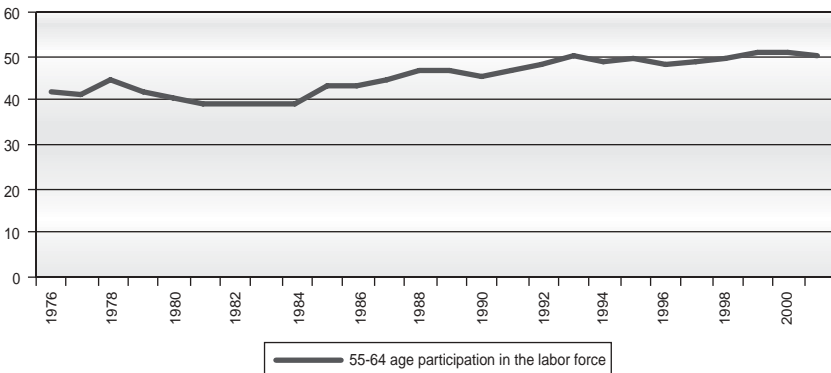
workers to a more advanced age. Disney and Whitehouse (1999) present a theoretical model to analyze how different types of pension plans affect retirement incentives. Their results show a powerful incentive to retire earlier under defined benefit plans, whereas defined contribution plans encourage people to stay in the job longer. Blöndel and Scarpetta (1998) and Gruber and Wise (1999) present empirical evidence for different countries showing that the decision to retire is closely related with the type of pension plan in existence.

In Chile, the share of people between fifty-five and sixty-four years of age in the work force increased from 38.9% in the year of the reform to 50% in 2001 (figure 4). To quantify the effect of the pension reform in Chile on the share of older people in the work force, we estimated the following equation, suggested by the estimates presented in the literature mentioned above:

$$Part\ 55-64_t = \alpha_0 + \alpha_1 reform_t + \alpha_2 Life\ exp._t + \alpha_3 unemployment\ 55-64_t$$

The dependent variable, *Part 55-64* is the share of people aged fifty-five and sixty-four in the labor force. Reform is the number of contributors in the new pension system as a proportion of all the contributors in both the new and the old system; this variable captures the effect of the pension reform on the labor share of older

**Figure N° 4**  
**LABOR SHARE OF PEOPLE AGED**  
**FIFTY-FIVE TO SIXTY-FOUR, 1976-2001**  
**(PERCENT)**



people. Life expectancy (*lifeexp*) was included as a control variable and the unemployment rate of the people between fifty-five and sixty-four years of age (*unemp* 55-64) as a cyclical variable<sup>24</sup>.

The equation was estimated by ordinary least squares (OLS) for the period 1976-2001. This basic equation and the various specifications that were estimated are shown in table 8. The only robust variable in all the specifications is life expectancy. The pension reform and unemployment variables are only significant at a 95% confidence level if life expectancy is excluded from the estimates. These estimates are therefore subject to an identification problem, which is possibly associated with the high colinearity shown by the explanatory variables<sup>25</sup>. The pension reform variable is thus significant only in equation 2, with an estimated coefficient of 0.037. A comparison of equations 1 and 3, however, suggests that the contribution of the pension reform variable in explaining the dependent variable is very low.

**Table N° 8**  
**ESTIMATED EFFECT OF THE PENSION REFORM**  
**ON THE LABOR PARTICIPATION OF OLDER WORKERS**

Dependent Variable: Part 55-64			
Explanatory variable	(1*)	(2*)	(3*)
Constant	-51.40 (0.11)	46.66 (0.00)	-17.63 (0.35)
Reform	-0.04 (0.20)	0.04 (0.04)	
Life exp.	1.39 0.00		0.89 0.00
Unemployment 55-64	-0.38	-0.84	-0.44
Summary statistic	(0.19)	(0.01)	(0.13)
Adjusted R squared	0.68	0.56	0.67

<sup>a</sup> All three equations cointegrate to a 95% confidence level according to the Dickey Fuller test; t statistics in parentheses.

<sup>24</sup> The life expectancy variable was obtained from the World Bank's index of life expectancy at birth.

<sup>25</sup> The partial correlation between life expectancy and pension reform is 0.9; between pension reform and unemployment, -0.6; and between unemployment and life expectancy, -0.73.



The pension reform variable thus affects the labor share of people between the ages of fifty-five and sixty-four with, at most, an estimated coefficient of 0.037. We used this coefficient to calculate the effect of the pension reform on employment due to an increase in the labor share of older people. Specifically, we obtained the change in the labor share of the group between fifty-five and sixty-four years of age that might potentially be attributed to the pension reform. We then obtained the change in the work force of people in this age group and, finally, used the unemployment rates for people between 55 and 64 years of age to estimate the change in employment as a result of the reform. The results show that 0.49% of the level of total employment in 2001 might be due to the pension reform, by this route. Unlike the research cited for other countries, however, we did not find these results to be robust.

## **5. CAPITAL MARKETS**

This section examines whether the pension reform has affected the overall development of the capital market or its regulation, size, or composition. We also consider the pension system's contribution to financial depth in Chile, measured by the volume of financial assets.

### **5.1. The development of capital markets**

This section describes the main qualitative effects of the pension reform on the Chilean capital market. We highlight its possible contribution to the quality of regulation, the improvement in corporate governance, and transparency; the specialization, innovation, and creation of new financial instruments; the size of the financial market; and secondary effects on the structure of the financial system and other markets. Table 9 summarizes the main evidence for Chile with regard to the effect of the pension reform on the development of the capital market.

#### *5.1.1. Financial regulation, corporate governance, and transparency*

The accumulation by the pension funds of a large volume of investable wealth led to the development of financial instruments in which the pension funds can invest. The institutions responsible for issuing these financial instruments have to

**Table N° 9**  
**CONTRIBUTION OF THE PENSION**  
**REFORM TO CAPITAL MARKET DEVELOPMENT**

Area of capital market development	Reform contribution
Financial regulation, corporate governance and transparency	<ul style="list-style-type: none"> <li>– Continuity in the process of legal changes to capital market regulation in 1980-1990</li> <li>– Increased flexibility with regard to investment of pension funds abroad</li> <li>– Election of independent directors in the firms in which funds are invested, reducing monitoring costs and improving the quality of information and creditor protection</li> <li>– Risk rating procedures that improve transparency</li> </ul>
Specialization, innovation and creation of new financial instruments	<ul style="list-style-type: none"> <li>– Implementation of advanced information services and technology</li> <li>– Development of institutions that reduce trading costs</li> <li>– Issuing of corporate bonds in the 1980s</li> <li>– Issuing of recognition bonds</li> <li>– Issuing of securitized mortgage credits</li> <li>– Creation of real estate companies and investment funds</li> </ul>
Market size	<ul style="list-style-type: none"> <li>– Growth of the bond market</li> <li>– Growth of the market for housing loans</li> <li>– Increase in traded volume of shares</li> </ul>
Secondary effects on the structure of the financial system and on other markets	<ul style="list-style-type: none"> <li>– Development of the insurance industry</li> <li>– Development of the mortgage industry</li> <li>– Development of the housing market</li> </ul>

provide the necessary information, so the growth of the pension funds must necessarily be accompanied by an improvement in the quality of financial system regulation, designed to enhance the transparency of practices in the financial market and in the management of the funds. The creation of risk-rating systems

provides an additional way to increase the transparency of the capital market.

The fact that the growth in the retirement funds and the institutional reform of the capital market occurred simultaneously in Chile suggests that such progress was a direct result of the pension system reform. The evidence clearly supports this causal relationship in a number of cases, such as the establishment of a risk-rating system for public-offering instruments or the incorporation of new regulations on conflicts of interests in the securities law, since the reforms were justified by the need to ensure an adequate framework for the process of investing pension funds.

Another remarkable aspect of the Chilean experience is the continuous process of legal change during the 1980s and 1990s. This phenomenon may also be interpreted as evidence of a close relationship between the accumulation of funds and the institutional transformation of the capital market, since it seems unlikely that these same dynamics would have occurred without the constant pressure exerted by the AFPs and life insurance companies through their growing demand for financial assets and their repeated presentation to the authorities of concrete proposals for improving the regulatory framework of the pension system and the stock market.

With regard to improvements in corporate governance, examples include the requirement that AFPs vote for independent candidates as board members, where funds are invested. Iglesias (2000) argues that this fact caused a fall in monitoring costs as a result of improvements in the quality of information and in protection for creditors.

As for capital market transparency, in 1985 the pension funds had to evaluate the risk of their securities themselves, according to parameters set forth by the authorities. This generated a constant exchange of information between the issuers of securities, the authorities, and the pension funds. The 1994 law led to the consolidation of independent risk-rating agencies, which explains the increase in the volume of business undertaken by the risk-rating firms. In 1996, for example, 125 risk classifications were registered in the stock market, and the number had risen to 252 by June 2002.

### *5.1.2. Specialization, innovation, and the creation of new financial instruments*

The volume of managed assets increased with the pension reform, warranting a growing level of specialization and requiring more professionalized management. This process of specialization should imply the use of new knowledge, together with new information and communications technology. In Chile, AFPs are using new information technology, investing in new instruments that require new know-how, such as forward contracts, and transferring technology from abroad. These are all examples of the specialization that has resulted from the pension reform.

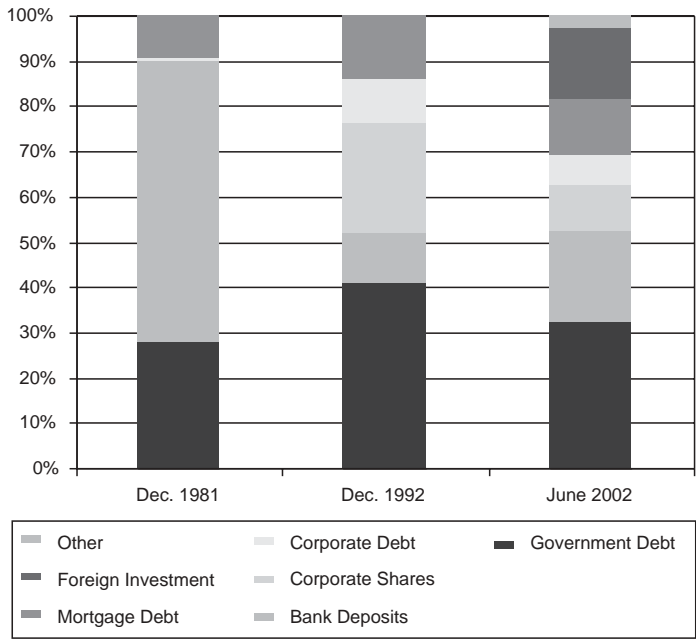
The accumulation of funds in AFPs and life insurance companies gave rise to the need to create institutions that would reduce trading costs. This was a driving force behind certain innovations in the Chilean capital market, such as the creation of a centralized electronic system of securities custody in 1995. Also, in 1985 the Santiago Stock Exchange implemented an electronic trading system and in 1990 created a new exchange with fully automated trading systems.

The creation of new financial instruments was another important process resulting from the pension reform. Corporate bonds, which were a novelty in the early 1980s, became relatively important in the pension fund portfolios by the early 1990s. The first real estate companies were set up in 1989 to facilitate the investment of pension funds in real estate. Similarly, the first investment funds were formed in 1991 to give pension funds the opportunities to invest indirectly in the real estate sector (real estate investment funds) and in the shares of firms whose securities are not traded on the stock exchanges (company development investment funds). Securitized mortgage credits were created specifically for the life insurance companies. These are not traded on the market because of their heterogeneity, so the pension funds cannot buy them directly, although they can do so indirectly through the real estate funds. Finally, the reform gave rise to the new possibility of investing abroad.

The continual innovation and creation of new financial instruments is also reflected in the diversification achieved by the pension fund portfolios. As shown in figure 5, in 1981 the pension fund portfolio was made up almost entirely of bank deposits

(61.9%) and government bonds (28.1%). By December 1992, the investment funds were also investing in company shares and mortgage debt, and by 2002 foreign investments were also an important part of the portfolio.

**Figure N° 5**  
**COMPOSITION OF PENSION FUNDS**



### 5.1.3. Size of the market

One of the most striking economic phenomena of the 1980s in Chile was the growth of the capital market. Although many circumstances explain this trend, the evidence of the Chilean case suggests that the growing demand for financial assets from the AFPs and life insurance companies may have stimulated the expansion in the volume of trading and the deepening of the market, the reduction in trading costs, the increase in the supply of long-term funds, and the reduction in the cost of company capital. Acuña and Iglesias (2000) show that the strongest impacts of the

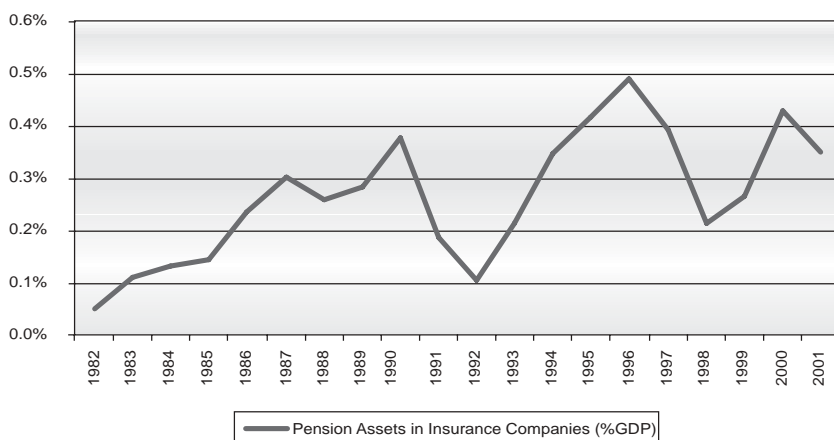
creation of the new pension system may be the increased supply of long-term funds, the development of the mortgage loan market, and the deepening of the stock market.

#### 5.1.4. Secondary effects on the structure of the financial system and other markets

Two of the most important secondary effects of the pension system reform involve the insurance industry and the housing market. The Chilean insurance industry grew enormously following the pension reform. Lefort and Walker (2001) demonstrate that insurance companies are handling over ten times the amounts they handled in 1981. The pension assets in the hands of the life insurance companies in 1982 represented 0.05% of GDP, whereas in 2001 they had risen to 0.35%, as shown in figure 6.

The Chilean housing market similarly benefited from the pension reform, which triggered the development of the mortgage industry. Pension fund and life insurance companies began investing in mortgage bonds right from the start, and they supported the creation and expansion of the endorsable mortgage credits.

**Figure N° 6**  
**PENSION ASSETS IN INSURANCE COMPANIES, 1981-2001**  
(AS PERCENTAGE OF GDP)



## 5.2. Financial depth

The previous section offered a qualitative analysis of the effects of the pension reform on the development of the Chilean financial markets. This section quantifies those effects. This exercise carries the enormous difficulty of quantifying reform effects such as the improvement in corporate governance and the development of the risk-rating industry. To do so, we concentrate on a variable of financial depth that aggregates the most important financial instruments of the Chilean capital market, although we recognize that this measurement leaves aside many of the effects described in the previous section.

Recent studies have reaffirmed the importance of financial development to the growth of the economy, mainly through an increase in total factor productivity<sup>26</sup>. Therefore, if the reform produces a quantifiable effect on financial development, it will also generate an important effect on the growth of the economy via that financial development.

Impávido and Musalem (2000) is one of the few empirical studies that quantifies the effect of the pension funds on financial development. These authors use a simple portfolio model with three assets –money, bonds, and shares– to measure the effect of the development of institutional investors on the size of the stock market in different countries. Using panel data for a set of countries, they find that the assets of institutional investors have a positive and significant effect on share capitalization. Lefort and Walker (2001) use time series to estimate the effect of pension funds on financial development in Chile. They incorporate three variables for the development of financial markets: the price/book ratio (as a proxy for funding costs), the volumes traded in shares, and the volatility of the share index. For the development of the pension funds, they use the amount invested in shares by the pension fund administrators; they find a positive relation between this variable and the financial variables used<sup>27</sup>.

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<sup>26</sup> A description of some of these studies is given in section 6.1

<sup>27</sup> Other studies that explain financial development assign an important role to inflation, which would have a nonlinear negative effect owing to the distortions that it introduces into the economy (see Boyd, Levine, and Smith, 2000; Khan, Senhadji, and Smith, 2002). Other variables used in recent studies on this subject are suitable for cross-sectional studies but not for time series analysis in an individual country; these

The aim of this section is to figure out the contribution of the pension system reform to the development of the financial markets in Chile, using econometric estimates based on time series. We control for all the variables that we believe had effects on this development, used in cross-sectional or variable models that are applicable to the Chilean case. The first step is to construct a variable that captures the country's financial development in the best possible way.

To measure financial depth, we constructed a ratio between an aggregate of financial intermediation assets and GDP. This variable, which we call the financial intermediation ratio (FIR), closely follows Braun et al. (2000). It corresponds to the sum of the main financial assets in the economy, expressed as a proportion of GDP. The choice of the variables that make up the FIR is based on two criteria: i) those used most frequently in recent empirical studies to verify the effects of different variables on financial development (Boyd, Levine, and Smith, 2000; Stulz and Williamson, 2003; La Porta, López-de-Silanes, and Shleifer, 2002); and ii) those that are applicable to the Chilean case and to the pension system reform according to the qualitative studies existing on the subject (mentioned in the previous section). The aggregate variable is a combination of the liquid liabilities of the banking system (IMF Liquid Liabilities, a measure of the size of the formal financial system frequently used in empirical studies), share capitalization, domestic private bonds, domestic public bonds, and mortgage-backed securities<sup>28</sup>. Two alternative measures of FIR were constructed to test the sensitivity of the results-namely, one that includes the difference between the

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include cultural and legal variables (Stulz and Williamson, 2003) and the state ownership of banks (La Porta, López-de-Silanes, and Shleifer, 2002). Barth, Caprio, and Levine (2002), who study the relation between regulation and supervision and the development of the banking system, find that regulation which allows the existence of more information and more private control over banks actually strengthens bank development. Typically, the control variables used in these studies are variables that capture the degree of government interference in the economy or the level of economic openness, because more open economies with less government intervention have fewer distortions on private economic activity.

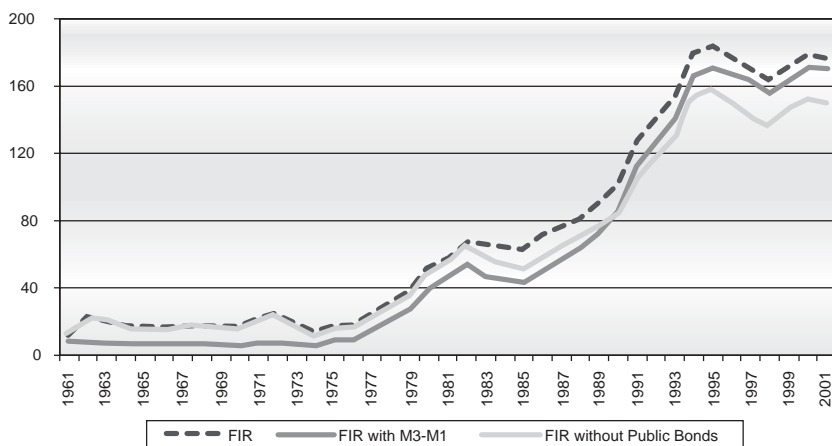
<sup>28</sup> The series were deflated using the procedure recommended by Beck, Demirgüç-Kunt, and Levine (2000) to address the measurement problems arising from the fact that financial variables are measured at year-end and GDP is measured throughout the year. The authors propose averaging the values of the deflated financial variable for the beginning and end of the year and dividing the result by GDP, deflated by an average of the price index.



monetary aggregates M3 and M1 instead of liquid bank liabilities and one that excludes public bonds<sup>29</sup>. The three different series for FIR are shown in figure 7.

We estimated a cointegration vector to explain financial development (FIR) as a function of a variable that captures the importance of the new pension fund system created by the 1981 reform<sup>30</sup>. We controlled for three groups of variables: structural reform variables, particularly financial liberalization; variables that, in simple portfolio models, influence the relative demand for different financial assets; and variables that capture possible cyclical effects of the financial markets. The variable that captures the pension fund reform is the flow of annual mandatory saving under the new private system, which was calculated using the series reported in Bennett, Schmidt-

**Figure N° 7**  
**FINANCIAL ASSETS, 1961-2001**  
(AS PERCENTAGE OF GDP)



<sup>29</sup> Other variables that were not used were private credit, for which the series is heavily influenced by the boom of the late 1970s and early 1980s, and the turnover ratio and stock exchange transactions, which do not show a clear trend for the Chilean case and which therefore does not capture the country's financial development. M7 was ruled out because there are no data for the 1960s.

<sup>30</sup> We use an independent variable that captures the total size of the new pension funds and not just the assets that are invested in certain instruments. Lefort and Walker (2001) use only the pension assets invested in the stock market as an independent variable.

Hebbel, and Soto (1999) and extended for the period 1998-2001 under the same procedure used by them<sup>31</sup>. This series is shown in figure 2 above.

The variables belonging to the group of structural reforms include the financial liberalization index shown in figure 8, which encompasses restrictions on interest rates and on the localization of credit, as well as the required reserve rate on bank credits; this index was constructed on the basis of Morley, Machado, and Petinatto (1999), Lora (2001), and Jeftanovic (1979)<sup>32</sup>. The structural reform group also includes two dummy variables for critical levels of inflation, one that takes the value 1 when current inflation and inflation in adjacent periods is under 20% and another that takes the value 1 when current inflation is under 10%<sup>33</sup>. Finally, the group incorporates the quantity of privatized assets as a proportion of GDP and an index of structural reforms excluding the contributions of financial liberalization (also shown

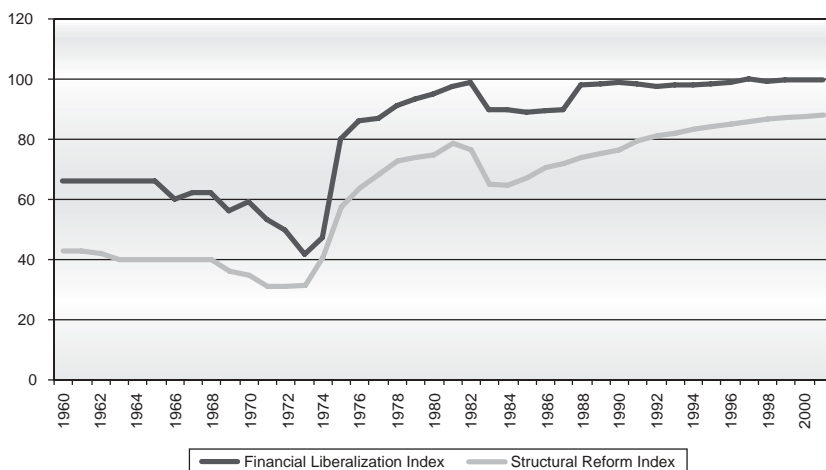
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<sup>31</sup> The construction method consists in adding only the flows reported by the Superintendence of AFPs, which represent mandatory saving, and subtracting the flow of actual pension payments. It should be adjusted by the flows that the AFPs transfer to the insurance companies but are not paid out immediately to pensioners in the form of life annuities. In addition, fixed-income assets are adjusted by a normal nominal yield, the distribution of investment dividends in shares are included, and capital gains are not included.

<sup>32</sup> This index, which includes the effects of financial repression in the equation, is based on the estimates of Morley, Machado, and Petinatto (1999) and Lora (2001). The problem is that the first series is available only for 1970 to 1995 and the second only for 1985 to 2000. To construct a complete series, we used Morley, Machado, and Petinatto (1999) for 1970-1995 and then expanded the series forward using Lora (2001), who indicates that the index remained almost constant in the second half of the 1990s. To expand the series backward, we used information on reserve requirements, credit restrictions, and interest rate restrictions, taken from a study of that period (Jeftanovic, 1979) that maintains that the credit and interest rate controls in place from the early 1970s through 1975 were imposed in 1966-though controls were also important before that date. With regard to reserve requirements, Jeftanovic shows that these were doubled in 1966 and then oscillated until 1970, increasing once again in 1971 and 1972. As it is not possible to make an exact calculation of the index with these measurements, this was constructed, while trying to maintain the relative differences between the various periods. A structural reform series was also constructed on the basis of the indices reported in Morley, Machado, and Petinatto (1999) and Schmidt-Hebbel (2001). The final index of financial liberalization and the index of total structural reforms are shown in figure 8.

<sup>33</sup> The existing literature on the relation between inflation levels and financial development (Boyd, Levine, and Smith, 2000; Khan, Senhadji, and Smith, 2001) finds a nonlinear relation between those variables and the existence of critical inflation levels, in which the relation has a discrete change. We therefore tested different functional forms for the inflation rate and different dummies, in an attempt to capture the existence of critical levels.

**Figure N° 8**  
**STRUCTURAL REFORM INDEXES, 1960-2001**  
 (INDEX RANGES FROM 0 = NO REFORM, TO 100 = FULL REFORM)



in figure 8)<sup>34</sup>. The variables relating to simple portfolio models are the real expected returns of bonds, shares, and money and the real expected return on foreign assets<sup>35</sup>. We also included a measure of the deviation of the real exchange rate, related to its tendency to reflect financial imbalances caused by exchange rate misalignment. Finally, we controlled for the level of aggregate saving to discover whether the effect of mandatory saving on financial development is different from the effect of total saving (which includes mandatory saving).

The specification of the initial equation is as follows:

$$FIR = \beta_0 + \beta_1 \frac{MS}{GDP} + \beta_2 (RER_t - \overline{RER_t}) + \beta_3 D_{inf < 10} + \beta_4 D_{inf < 20} + \beta_5 \frac{Priv}{GDP} + \beta_6 FinLib$$

<sup>34</sup> The structural reform index was constructed on the basis of the indices reported in Morley, Machado, and Petinatto (1999) and Schmidt-Hebbel (2001).

<sup>35</sup> For expected returns, the rates used were the expected inflation rate, the expected devaluation rate, and the expected value of the share index for the next period, plus the real interest rate and the real London interbank offered rate (LIBOR) rate. Autoregressive specifications were used for expected variables.

$$+ \beta_6 \text{Re } fIndex + \beta_7 \frac{TS}{GDP} + \beta_8 EBR + \beta_9 EMR + \beta_{10} ESR + \beta_{11} EER$$

where FIR is the financial development variable defined above;  $\frac{MS}{GDP}$  is the flow of mandatory savings in the pension system in each period as a proportion of GDP;  $RER_t - \bar{RER}_t$  is a measure of the gap between the real interest rate and its trend;  $D_{inf<10}$  is a dummy that takes the value 1 when inflation is less than 10%;  $D_{inf<20}$  is a dummy that takes the value 1 when current inflation and that of adjacent periods is under 20%;  $\frac{Priv}{GDP}$  is the stock of privatized assets as a proportion of GDP; finLib is a measurement of financial liberalization; RefIndex is an index of structural reforms;  $\frac{TS}{GDP}$  is total savings as a proportion of output; EBR is the expected bond return; EMR is the expected monetary return; and EER is the expected return on external assets.

Starting from this specification, we estimated a series of equations to test the robustness of the estimated parameter that links the pension system reform with financial development. The equations are described in detail in appendix 4, and the results are presented in tables 10 and 11. The parameter was found to be quite robust for the different specifications, maintaining its significance and a similar value in twenty estimated equations. The only case in which the value of parameter changed significantly was when the privatized assets variable was not included in the equations: the parameter increased from around 7.5 to around 11.7. This is surely due to the fact that whenever a variable that is important for financial development is omitted, any correlated variables include its effects. Another possibility is that the two policies complement one another: the development of the new pension system may have contributed to the privatizations' success in boosting financial market development, such that controlling for privatized assets may lead to underestimate the effect of the pension funds.

To summarize, we observe a long-term relation between financial development, the control variables, and the mandatory saving variable. The estimated parameter for the contribution of pension savings flows on financial development is quite strong and is situated within two ranges, one around 7.5 when the estimation includes privatization as a proportion of GDP, which implies a contribution of 31% to financial development between 1980 and 2001, and one around 11.7% when this latter variable is excluded,

and which indicates a contribution of 46% to financial development in that period. The estimation results are shown in table 10.

6. ECONOMIC GROWTH

We now turn to the issue of how the pension reform, through its contribution to increasing financial maturity, affected the efficiency of the economy, measured by total factor productivity. Taking this result in combination with the effects on the

Table N° 10  
ESTIMATED EQUATIONS FOR THE RATIO OF FINANCIAL  
ASSETS TO GDP (FIR), 1961- 2001

Dependent variable: FIR (1961-2001)																				
	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5	Eq 6	Eq 7	Eq 8	Eq 9	Eq 10	Eq 11	Eq 12	Eq 13	Eq 14	Eq 15	Eq 16	Eq 17	Eq 18*	Eq 19**	Eq 20
Constant	-7 70	-14 23	-11 56	-15 38	-17 16	-14 38	-4 80	-7 61	24 3	15 0	-11 20	-2 75	-12 24	8 7	20 0	-15 51	-21 10	4.6 2	14 0	15 0
Flow of Mandatory Saving	8.7 0	8.4 0	7.2 0	7.2 0	7.9 0	6.5 0	6.7 0	6.8 0	7.5 0	7.9 0	11.7 0	11.4 0	11.5 0	8.0 1	22.0 0	19.0 0	16.0 0	6.2 0	6 0	
REP gap	-0.3 6	-0.3 1	-0.4 0	-0.4 0	-0.3 0	-0.3 0	-0.3 0	-0.4 0	-0.3 1	-0.3 1	-0.3 6	-0.3 4	-0.3 6	-0.8 0	-0.9 0	-0.9 2	-0.8 2	-0.3 4	-0.4 0	-0.4 0
D (INF<10)	12 0	12 0	12 0	12 0	11 0	10 1	11 1	12 0	9 3	9 3	13 1	12 2	13 2					15 0	9 2	
D (INF<20)	40 0	42 0	46 0	46 0	42 0	45 0	46 0	46 0	50 0	51 0	59 0	55 0	59 0					57 0	41 0	44 0
Privatizations/ GDP	1.9 13	1.9 12	3.8 0	3.7 0	2.2 7	4.8 0	4.0 0	3.9 0	4.1 0	3.5 0				6.6 0				3.6 0	3.1 0	5.4 0
Financial Liberation	-0.19 56		0.38 12	0.4 11			0.27 23	0.31 15	-0.13 40		0.46 0		0.46 0			0.5 12				
Structural Reforms Index (without financial liberalization)	1-17 2	0.99 0			0.81 2							0.53 0					0.95 0			
Total Saving/ GDP	-69 8	-61 9	-22 56										10.5 83							
Expected Bonds Return	-84 0	-80 0	-50 0	-50 0	-69 0	-31 1	-47 1	-50 1												
Expected Money Return	5.1 63	1.2 88	-10 27	-11 21	-2 80															
Expected stocks Return	-7.5 5	-7.2 5	-5.8 14	-5.7 15	-6.6 8	-4.3 20	-3.4 32													
Expected External Return	2.3 63																			
Stock of Mandatory Saving																				0.9 3
R <sup>2</sup> Adjusted	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.91	0.85	0.85	0.88	0.99	0.98	0.97
	##	##	##	##	##	##	##	##	##	##	##	##	##					##	##	

In cursive the confidence to accept the nil hypothesis that the parameter equals zero.

# # Cointegrates to 5% significance according to Mckinnon's values

\* The FIR variable excludes liquid bank liabilities.

\*\* The FIR variable excludes public bonds.

investment rate and on labor markets, we also consider the quantitative contribution of the pension reform on growth between 1981 and 2001 and make predictions for the future.

## 6.1. Total factor productivity

The previous section found that a considerable part of the strong financial development that occurred in Chile during the past two decades had its origin in the creation and development of a pension fund system based on individual accounts managed by private institutions. This allowed an expansion of the supply of financial instruments in the country.

This section quantifies estimates the contribution of the Chilean pension system reform to the growth of the economy, through the increase in total factor productivity stemming from greater capital market development. One of the main features of greater financial development is that it improves the allocation of resources in the economy, so these may be employed where they will yield higher returns, thus increasing the productivity of the factors of production. We thus estimate an equation for total factor

**Table N° 11**  
**ESTIMATED EFFECTS OF THE PENSION**  
**SYSTEM REFORM ON FINANCIAL DEVELOPMENT**

Equation	Dependent Variable (Financial Development)	Explanatory Pension Variable	Estimated Parameter	Percentage Change of the Dependent Variable (1980-2001) due to the Change in the Explanatory Variable
10	FIR	Flow of Mandatory Saving	7.5	31%
11	FIR	Flow of Mandatory Saving	11.7	46%
18	FIR without liquid liabilities, with M3-M1	Flow of Mandatory Saving	6.2	23%
19	FIR without public bonds	Flow of Mandatory Saving	6	30%
20	FIR	Stock of Mandatory Saving	0.9*	33%

\* It is not cointegrated for the traditional confidence values.

productivity (TFP) as a function of FIR (the financial variable used in the previous section to quantify the pension reform's contribution to financial development) and other control variables used in recent studies on the subject<sup>36</sup>.

As in the previous section, most of the existing empirical studies intended to explain the behavior of TFP are based on cross-sections of countries, and very few model the development of this variable over time for a single country. Many research studies estimate cross-sectional equations to investigate the link between financial development and economic growth. King and Levine (1993) find that the ratio of liquid liabilities in the financial system to GDP, the ratio of private bank credit to total bank credit, and the credit of private companies as a proportion of GDP—controlling for initial per capita income, initial education, measures of political stability, and monetary, exchange, fiscal, and trade policies—have important effects on the economic growth of countries. Levine and Zervos (1998) also include stock market development, with measures of size and activity, and find a significant relation between share liquidity and banking development and the growth in output, the capital stock, and factor productivity. The results also show that the effect on output growth occurs mainly through the increase in total factor productivity, with the growth in the capital stock making a much smaller contribution. Levine, Loayza, and Beck (2000) study whether the relation between financial development and growth is due to a third variable or whether there is indeed a causal relationship, using the legal origin of countries as instrumental variables for financial development and using dynamic panels to control for the possible endogeneity of the regressors. The results confirm that the relation between financial development and growth is not due to simultaneity bias. Beck, Levine, and Loayza (2000) carry out this same exercise using savings, capital, and total factor productivity in addition to output growth. They find that the relation between financial development and productivity growth is much stronger than the relation with growth in the capital stock. Finally, Rousseau and Sylla (2001) find that financial development causes output to grow in the first stages of development, but that the

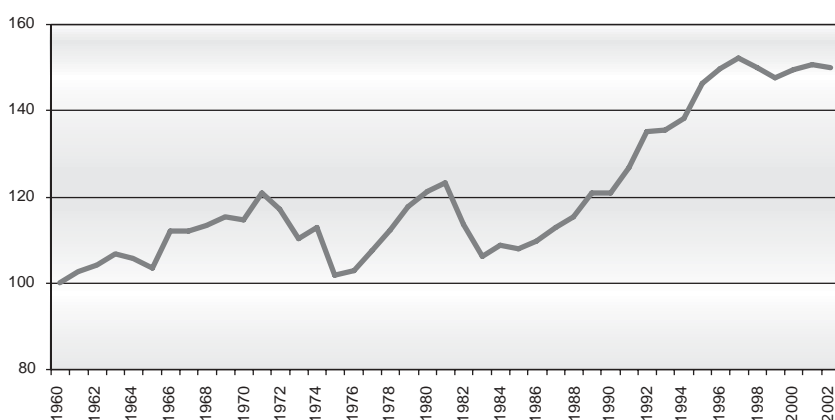
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<sup>36</sup> Here we are assuming that the causality goes from financial maturity to TFP and not from TFP to financial maturity (for evidence on this point, see Levine, Loayza, and Beck, 2000).

opposite is true in the later stages of development, when the financial systems have already matured. However, the productivity channel (where financial development increases total factor productivity) remains important while the economy is maturing.

To construct the total factor productivity series, we calculated the difference between output growth and factor growth, without adjusting for quality<sup>37</sup>. We weighted the growth of labor by 60% and capital growth by 40%<sup>38</sup>. Figure 9 shows the estimated productivity variable, which maintains a relatively stable level with strong cyclical movements until the mid-1980s, after which it exhibits strong sustained growth until 1998 (a period that has been termed the “golden age of growth” in Chile). The series stabilizes after 1998, which reflects the fall in average growth rates in the economy from that year onward. The level of the terms of trade is an important independent variable in the specifications used, which is justified by the strong increase in the terms of trade between the mid-1960s and the mid-1970s. Since the capital account was

**Figure N° 9**  
**TOTAL FACTOR PRODUCTIVITY, 1960-2002 (1960=100)**



<sup>37</sup> Only capital was adjusted by the unemployment rate to partially eliminate cyclical effects, assuming that the rate of capital utilization is similar to that of labor.

<sup>38</sup> These values are those found by Braun and Braun (1999) after correcting measured output in the National Accounts.



relatively closed in that period, the better terms of trade relieved financing restrictions and thus allowed better levels of capacity use, over and above those reflected in the capital use coefficient that we used in the regressions. Although it is a long-term specification, including the terms of trade makes it possible to identify more accurately the effect of the structural reform process that began in the second half of the 1970s. The rest of the control variables are the structural reforms index explained in the previous section (which includes indices for trade, financial openness, tax, and privatization reforms), the inflation level, an index of labor quality, the ratio between public spending and GDP, and the implicit tariff on imports<sup>39</sup>. These are not only policy variables, but also variables for policy results; we therefore estimate different specifications for the long-term equations in order to infer the true effects of FIR on TFP.

Although all the dependent variables have a unit root in the sample used, they should be stationary in normal samples- a property that TFP does not have according to traditional growth models<sup>40</sup>. To solve this problem, we added trends to the estimated equations to test the robustness of the parameters, assuming that long-term TFP growth is produced at an exogenous rate. The specification takes the following structure:

$$\ln TFP = \alpha_0 + \alpha_1 FIR_t + \alpha_2 \ln TT_t + \alpha_3 Open_t + \alpha_4 SRI_t + \alpha_5 \frac{\pi_t}{1 + \pi_t} + \alpha_6 LQI_t + \alpha_7 \frac{Pub_t}{GDP_t} + \alpha_8 IT_t + \alpha_9 t$$

where  $\ln TFP$  is the natural log of the total factor productivity index;  $FIR_t$  is the financial development index defined in the previous section;  $\ln TOT_t$  is the natural log of the terms of trade;  $Open_t$  is the openness variable, defined as the ratio between the sum of exports and imports and GDP;  $SRI_t$  is the structural reforms index, whose construction is explained in the previous section;  $\frac{\pi_t}{1 + \pi_t}$  is a normalized function of the inflation rate;  $LQI_t$  is the labor quality index from Chumacero and Fuentes (2000);  $\frac{Pub_t}{GDP_t}$  is the ratio of public spending to GDP;  $IT_t$  is the implicit tariff; and  $t$  is a linear trend.

Starting from the general specification above, we estimated seventeen equations to verify the soundness of the estimated relation between

<sup>39</sup> Many of these variables are correlated with each another, but they are included separately in the equations to check whether they contain additional information.

<sup>40</sup> With the exception of the labor quality index.

the growth in FIR and that of TFP. The results are presented in table 12 and explained in detail in appendix 5. We found quite sound results: the parameter relating FIR with TFP is always significant and only changes in magnitude when the openness variable is omitted from the equations. The above may once again be due to a problem of interaction between the two variables, in which possible effects of financial depth on TFP, through the increased openness of the economy, are not attributable to the FIR variable when it also includes the openness variable. The estimates thus indicate that the estimated parameter for the relation between FIR and TFP is significant for a series of alternative estimates and moves between two ranges, one around 0.07 when the openness variable is included in the estimate (equation 6 in table 12) and the other around 0.17 when that variable is excluded (equation 10 in table 12). There are theoretical reasons to hold that the former underestimates the effect and the latter overestimates it. These parameters indicate that the contribution of financial development lies between 32% and 57% of the change in TFP between 1960 and 2001.

**Table N° 12**  
**ESTIMATED EQUATIONS FOR TOTAL**  
**FACTOR PRODUCTIVITY (TFP) 1961-2001**

Dependent variable: Ln TFP (1961-2001)																	
	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5	Eq 6	Eq 7	Eq 8	Eq 9	Eq 10	Eq 11	Eq 12	Eq 13	Eq 14	Eq 15	Eq 16	Eq 17
Constant	3.4 0	3.5 0	3.5 0	3.5 0	3.5 0	3.6 0	3.7 0	3.6 0	3 0	3.2 0	3.2 0	3.2 0	3.1 0	3.2 0	3.9 0	4.6 0	4.7 0
FIR	0.09 2	0.10 0	0.08 0	0.08 0	0.08 0	0.07 0	0.08 0	0.08 0	0.16 0	0.17 0	0.16 0	0.16 0	0.15 0	0.17 0	0.22 0	0.06 8	0.22 0
Ln TT	0.20 0	0.20 0	0.19 0	0.19 0	0.19 0	0.16 0	0.16 0	0.17 0	0.28 0	0.26 0	0.26 0	0.26 0	0.26 0	0.26 0	0.13 0		
Openness	0.72 0	0.68 0	0.73 0	0.69 0	0.69 0	0.77 0	0.80 0	0.77 0								1.16 0	
Structural Reforms Index	0.1 48	0.08 44	0.07 53	0.06 51	0.07 49				0.34 3	0.37 0	0.35 0	0.37 0	0.34 0	0.36 2		-0.41 0	-0.16 3
INF / (1 + INF)	-0.03 43	-0.03 42	-0.01 73	-0.01 61				-0.01 58	-0.05 21			-0.1 83					
Labour Quality Index	-0.05 58	-0.05 58	-0.04 66						0.06 56				0.09 32				
Public Expenditure to GDP	0.1 40	0.1 39							0.2 16								
Implicit Tariff	0.06 72								0.3 98					-0.02 92			
Trend							-0.002 23				5E-04 73						
R <sup>2</sup> adjusted	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.93	0.93	0.93	0.93	0.92	0.90	0.91	0.83
	##	##	##	##	##	##	##	##	##	##	##	##	##	##			

In cursive, the confidence to accept the null hypothesis that the parameter is equal to zero.

# It cointegrated to 5% significance according to Mckinnon's values.

## It cointegrates to 10% significance according to Mckinnon's values.

Once we have identified the contribution made by financial development to total factor productivity through the FIR variable, we can use the results of section 5.2, which establish the relation between FIR and the development of the pension system, to estimate the contribution of the latter to the TFP growth rate. We based our calculations on three scenarios. The first assumes that the privatization variable in the explanatory equation for FIR and the openness variable in the explanatory equation for the TFP are not affected by either the creation of the pension funds or the growth in FIR. This means that the estimated coefficients in equation 10 of table 10 and in equation 7 of table 12 are the correct ones for evaluating the effects. In the other two scenarios, we assume that a fraction of the effect of the independent variables is produced through the control variables, such that scenario 1 underestimates the effects. The third scenario further assumes that half the difference between the estimated parameters –equations 10 and 11 in table 10 and equations 7 and 10 in table 12– is attributable to the effect of mandatory savings flows over FIR and FIR over TFP. This difference would be the magnitude of the effect of the first variables over the second, by means of the increase in the benefits of the privatizations and openness, respectively. In the intermediate case of scenario 2, we assume that a quarter of the difference is attributable to the explanatory variables mandatory savings flow and FIR.

The estimated results imply an average growth in total factor productivity attributable to the pension reform of 0.12%, 0.20%, and 0.27% for scenarios 1, 2, and 3, respectively, for the period 1980-2001. The average growth of the TFP for the same period was 1%.

## **6.2. Economic growth**

This section uses the estimates carried out in the previous sections to assess the pension reform's contribution to growth in the period 1981-2001 and explore its future contribution in the medium and long term. To this end, we break down the effects in terms of savings and investment, labor markets, and financial development.

Our analysis is based on a Cobb-Douglas production function with constant returns to scale and diminishing returns to factors, with technological progress reflected in total factor productivity. We analyze the effects of the reform in a context where the increase in factor productivity or in the factor accumulation rate does not have

permanent effects on the growth rate, but only on the level of output in the short and long term. This assumption is not particularly important for evaluating the effects of the reform in the post-reform period (1981-2001), but it is important for making long-term inferences, as we discuss below. The production function is

$$(1) \quad Y_t = TFP_t K_t^{0.4} L_t^{0.6}$$

where  $Y_t$  is the level of output,  $TFP_t$  is the level of the total factor productivity,  $K_t$  is the level of capital, and  $L_t$  is the level of employment.

We can briefly summarize the mechanisms through which the reform has affected output by means of the following three equations, for the capital stock, employment, and total factor productivity, respectively:

$$(2) \quad K_t = \chi (VP_t^3, \dots)$$

$$(3) \quad L_t = \theta (VP_t^2, \dots)$$

$$(4) \quad TFP_t = \gamma (FIR_t (VP_t^1, \dots), \dots)$$

where each production factor is related with one or more variables affected directly by pension variables ( $PV_t^i$ , for  $i = 1, 2, 3$ ), as identified in sections 3, 4 and 5.1-6.2, respectively.

Below we check and quantify the effects on the economic growth rate through each of the three identified channels separately. We present estimates of the aggregate effects of the pension reform on the average growth of the period 1981-2001 and on the level of GDP in 2001. We then use this quantitative evaluation to provide a qualitative overview of the probable future effects of the reform.

### *6.2.1. Effects of the pension reform in the period 1980-2001*

#### *Saving and investment*

In section 3 we looked empirically at the effects of the pension reform on the investment rate in the economy. The government has to finance the transitional deficit either by issuing debt or by adjusting its level of spending or income. The aggregate of lost savings incurred by the government as a result of the reform and

its fiscal funding is only partially offset by increased private saving. At the same time, the greater mandatory saving introduced by the reform is also partly offset by reduced voluntary saving. We found that for different ranges of the given parameters, the pension reform had a positive effect on saving in Chile. Thus, using the estimated relation between savings and investment, we estimate that the effect of the reform on the rate of investment ranges from 0.3% to 2.8% of GDP, with an intermediate value of 1.2% of GDP.

We obtain the effect of the investment rate on GDP growth by using the following equation 5 to replace the increase in the capital stock (determined by the investment rate,  $i$ , and the capital depreciation rate,  $\delta$ ) in equation 6 for the GDP growth rate, which is consistent with the production function of equation 1:<sup>41</sup>

$$(5) \quad \hat{K} = i \frac{Y}{K} - \delta$$

$$(6) \quad \hat{Y} = \hat{A} + 0.4 \hat{K} + 0.6 \hat{L}$$

where the hats over the variables indicate growth rates.

We estimated the equations for the investment rate and their effects on GDP growth and on the level of GDP in 2001. The methodology used to calculate the effects of the reform on GDP growth in 1981-2001 and on the level of GDP in 2001, through the three mechanisms identified, is explained in detail in appendix 6; the results are shown in table 13. The average GDP growth rate observed in Chile from 1980 to 2001 was 4.63% per year. The effect of the reform on growth through the increase in the domestic investment rate is estimated within a range of 0.03 to 0.32 percentage points, with an intermediate value of 0.13 percentage points. This results in an output gain equivalent to 1.39% of GDP in 2001 for the intermediate case, with a minimum of 0.27% and a maximum of 4.28% of GDP for 2001 (see table 13).

### *Labor markets*

The pension reform led to a significant decrease in the pure tax on employment in Chile, producing a closer link between social

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<sup>41</sup> The capital depreciation rate is 5%, which is consistent with the capital stock time series.

security contributions and expected future pensions. This led to an increase in both total employment and formal sector employment. We estimate that this effect occurred gradually, in line with the transfer of contributors from the old system to the new. To measure the effect on the GDP growth rate in 1981-2001 and on the GDP level in 2001, we assumed that this gain owing to increased employment was completed in 2001, an approximation that is consistent with the data on membership of the old system in 2001, presented in section 2.2.

**Table N° 13**  
**TOTAL ESTIMATED EFFECTS OF THE PENSION**  
**REFORM ON THE GROWTH AND LEVEL OF GDP**  
**(IN PERCENT)**

Indicator	Case 1	Case 2	Case 3
Real average growth of the GDP 1980-2001	4.63	4.63	4.63
<b>1. Estimated effects of the reform on GDP growth</b>			
1 Saving and investment	0.03	0.13	0.32
2 Labor markets			
2.1 Increase in employment	0.04	0.07	0.11
2.2 Increase in productivity	0.01	0.03	0.04
3 Financial development and TFP	0.13	0.20	0.27
Total**	0.22	0.49	0.93
<b>2. Estimated effects of the reform on the level of GDP in 2001</b>			
1 Saving and investment	0.27	1.39	4.28
2 Labor markets			
2.1 Increase in employment	0.35	0.78	1.40
2.2 Increase in productivity	0.12	0.27	0.50
3 Financial Development and TFP	1.19	2.17	3.57
Total**	1.92	4.62	9.75

\*\* The total is calculated as a compound rate and is therefore not equivalent to the sum of the individual effects. See appendix 6 for further details.

Using equation 6 and the methodology explained in appendix 6, we estimated the contribution of the pension reform to growth in 1980-2001, through the creation of employment, to range between 0.04 and 0.11 percentage points, with an intermediate value of 0.07 percentage points. This translates into an intermediate gain of 0.78% of GDP in 2001, with a range of 0.35% to 1.40% of GDP (see table 13).

The change in the sector composition of employment increased the average productivity of labor in the Chilean economy. According to the estimates presented in section 4.2, this reform effect explains 0.03 percentage points of the growth in 1981-2001 in the intermediate case, which translates into a contribution of 0.27% of GDP in 2001.

The pension reform also increased employment by increasing the share of older workers in the work force. According to the estimates presented in section 4.3, 0.49% of employment in 2000 may be attributed to the pension reform through the increased participation of older age groups. This translates into a contribution of 0.015% to the output growth registered between 1981 and 2001. However, given that these results are less robust than the other results found in the paper, and that their magnitude is quite low compared with the other effects, we exclude the effect of the pension reform on employment through this channel from the overall effect of the pension reform on the growth of the economy.

#### *Total factor productivity*

The level of total factor productivity rose with the increasing maturity of the Chilean capital market, which, in turn, was largely due to the existence of the pension savings, intermediated by the pension funds, as we estimated quantitatively in section 5.2 and 6.1.

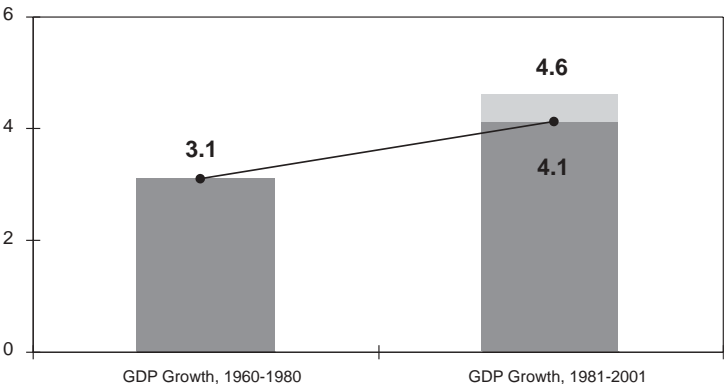
The growth in TFP is reflected one to one in the growth of GDP. As shown in table 12, the pension reform contributed 0.20 percentage points through this channel to the average growth in 1981-2001. This intermediate value is found within a range of 0.13 to 0.27 percentage points. These figures imply an intermediate gain of 2.17% of GDP in 2001, with a range from 1.19% to 3.57% of GDP.

*Overall effects of the pension reform on GDP*

Adding up the contributions of the three channels through which the pension reform has operated gives the overall contribution of the reform to growth and to GDP for 2001 (which is not much lower than GDP for 2003). The plausible combinations of parameters and assumptions that are behind the intermediate case suggest a reform contribution of 0.49 percentage points to the average growth of 4.63% observed in 1981-2001 (see figure 10). As shown in table 13, this figure differs from the sum of the individual effects, owing to the fact that it is calculated as a compound rate (see appendix 6 for more details).

This significant contribution to growth 1981-2001 means that 4.62% of GDP for 2001 could be attributed to the reform. These values are found near the centre of the ranges determined for the more extreme estimates of the reform effects: 0.22 to 0.93 percentage points of growth (1981-2001) and 1.92% to 9.75% of the level of GDP for 2001. Therefore, the direct and indirect effects of the pension reform on the country's output, through the fiscal funding of the reform, the accumulation and utilization of productive factors, and the level of efficiency with which these are used have all been substantial in the twenty-two years since the reform was implemented.

**Figure N° 10**  
**CONTRIBUTION OF THE PENSION**  
**REFORM TO ECONOMIC GROWTH**  
(PERCENT)





### *6.2.2. Effects on future growth*

Table 14 summarizes the future qualitative effects of the reform. We divide the data into three periods: the historic period of 1981-2001, for which we quantified the effects above; the period 2002-2035, which represents a rough estimation of when the transition of the system should be complete; and the period after 2035, in which the economy will converge to its economic steady-state, in response to the pension reform. The table uses plus and minus signs to identify the magnitude of the future effects that we expect to see compared with the magnitudes quantified for the first period.

The effects through investment depend on the two channels of changes in saving. The fall in public saving and its partial compensation by private saving is most intense during the first period and will tend to fall off with the convergence of the transitional pension deficit toward zero, which should occur around 2035. The second effect in saving, derived from mandatory saving and its partial compensation by voluntary saving, is also on the wane. Not only will pension savings cease to grow as the transfer of workers from the old system to the new is completed, but the magnitude of withdrawals by pensioners under the new system will increase during the period 2002-2035. In the long term, the rate of mandatory saving will converge at a level consistent with the stability of the ratio between pension fund assets and GDP (apart from normal fluctuations arising from the volatility of the rate of return).

In the case of labor markets, the change in total employment owing to changes in pure tax and labor productivity was largely completed by 2001, with the transfer of active contributors to the new system. The effect of the reform on growth through labor markets is thus now totally complete, as indicated in table 14.

Finally, the effect of the development of the pension funds on productivity also tends to fall over time. This is due to the conjunction of two characteristics: the ratio of pension flows (and assets) to GDP will stabilize in the future, and this ratio affects only the level of TFP and not its growth rate. The effects of the pension funds on the volume of financial intermediation is thus temporary, and its effect on growth will converge toward zero as the Chilean economy moves toward its new steady-state equilibrium.

**Table N° 14**  
**QUALITATIVE ESTIMATE OF PAST AND FUTURE**  
**EFFECTS OF THE PENSION REFORM ON GROWTH**

Channel	Historic post-reform period (1980-2001)	Future systemic transition period (2002-2035)	Future steady state (2035-onward)
1. Investment	++	+	tends towards 0
Domestic saving (public saving less private saving)	-	-	0
Private Saving (compulsory saving less voluntary saving)	+++	++	tends towards 0
2. Labor markets			
Increase in employment and decrease in informality	++	0	0
Increase in labor productivity	+	0	0
3. Financial markets			
Effects on financial development and TFP	++	+	0
4. Total effects on growth	++	+	tends towards 0

The estimates of the effects of the pension reform on growth were obtained using an exogenous growth model, in which the long-term growth rate does not respond to either permanent changes in factor accumulation or to permanent changes in the determinants of the level of efficiency with which these factors are used (TFP). This assumption is not restrictive for the estimates carried out for the historic period 1981-2001, but it certainly affects possible inferences for future long-term growth. If we use an endogenous growth model, the pension reform would have effects on the steady-states growth rate<sup>42</sup>.

<sup>42</sup> Corsetti and Schmidt-Hebbel (1997) simulate the effect of a pension reform on growth for an economy like Chile, using an endogenous AK model by Romer. Holzmann (1997) estimates the effects of the pension reform using an (endogenous) reduced-form growth equation.

## 7. CONCLUSIONS

We have made a comprehensive quantitative evaluation of the macroeconomic effects of the pension reform implemented in Chile in 1981. We used the literature on macroeconomics and public finance to develop and empirically apply models that are relevant to the Chilean experience, in order to estimate the reform's impact on macroeconomic flows, the factor market, and economic growth in the period 1981-2001.

Our evaluation centered on three main channels through which the reform has manifested itself: saving and investment, labor markets (levels of employment and labor productivity), and capital markets (and therefore total factor productivity). The reform increases domestic saving by an amount that depends on the fiscal financing of the transitional deficit and the private reaction to it, as well as on the increase in mandatory saving in the pension funds and the reaction of voluntary saving to it. The combined effect of these changes is reflected in the fact that average domestic saving increased by 0.7% to 4.6% of GDP per year, with a point estimate of 2.3% of GDP, during the twenty-one years following the reform. Consequently, the investment rate increased by the equivalent of 1.2% of GDP during the same period.

The reform significantly reduced the pure tax on employment, accounted for by the difference between social security contributions and expected future benefits, which was very large in the old pay-as-you-go system. This reduction in the implicit labor tax caused total employment in the Chilean economy to grow between 1.3% and 3.7%. Formal employment increased even more, between 3.2% and 7.6%, while informal employment contracted. This change in the composition of employment reflected in a rise in average labor productivity in Chile.

The mandatory social security savings, channeled to the pension funds, contributed significantly to deepen the financial maturity of the Chilean economy. We estimate that between 31% and 46% of the notable increase in the rate of financial assets to GDP was due to the growth of the pension funds between 1981 and 2001 (controlling for other factors, including other structural reforms). Financial maturity, meanwhile, is one of the most important and robust determinants of GDP growth and, in particular, of total factor productivity (TFP), as reflected in international experience.

TFP grew at an average of 1% per year in 1981-2001. Of that, we estimate that 20 percentage points (in a range between 13 and 27 percentage points) are due to the increase in pension savings, again controlling for other factors and structural reforms.

Using a standard production function for the Chilean economy, we quantify the contribution of the pension reform to GDP growth in 1981-2001 and to the level of GDP in 2001, through the three channels identified above. Our point estimate for the pension reform's contribution to growth during 1981-2001 (which reached an average annual rate of 4.6%) is 0.5 percentage points, in a range from 0.2 to 0.9 percentage points. Similarly, 5% of the level of GDP in 2001, with a range of 1.9% to 9.8%, is due to the reform.

The direct and indirect effects of the pension reform on the country's output –through fiscal financing, factor accumulation and utilization, and the level of factor productivity– have thus been substantial in the twenty-two years into the new system. For the future, we estimate that the pension reform's contribution to the growth rate will converge to zero, as the elimination of the pay-as-you-go system reaches completion and the economy moves toward its new dynamic steady-state equilibrium.

The long Chilean post-reform experience of over two decades constitutes a unique case in the global experience of countries that have substantially reformed their pension systems. The results of the Chilean experience, as presented in this study, can be used to draw relevant inferences for more recent pension reforms in other countries, despite the idiosyncratic characteristics of the previous system in Chile, the structure of the country's economy, and its policy framework. Many pension reforms carried out around the world since the late 1980s have similar features to the Chilean case. These include the adoption of at least a subsystem, or pillar, of defined contributions, channeled into privately managed pension funds invested in the capital market, which encourages employment and the formalization of labor markets, the development of capital markets, and the efficiency of domestic production. The quantitative effects on saving and investment, labor and capital markets, and economic growth depend on the depth of the pension reforms and the structural characteristics of the economies in which they are inserted. The more radical the replacement of the pay-as-you-go system by a fully-funded system, and the greater the extent to which the transitional deficit

is funded by fiscal readjustment, the greater will be the effects on the accumulation and efficient use of productive factors. The more informal employment and the more incipient the labor markets, the greater will be the impact of the reform on the development of factor markets.

One last, more qualitative, lesson to be learned from the Chilean experience is on the complementarity of pension reform with other changes in economic policies. In Chile, the pension reform was one of many efforts in stabilization policies and structural reforms in the 1970s, 1980s, and even into the 1990s. We have therefore used the influence of other policies as a control when analyzing the impact of the pension reform on financial maturity and total factor productivity. But beyond these controls, the interaction between the pension reform and other policy changes probably magnifies the potential effects of all of them. For example, fiscal stabilization in combination with pension reform contributes to higher saving and investment levels; labor reforms that lower other roots of pure taxes on labor contribute with the pension reform to raising total and formal employment; and financial liberalization, both domestic and external, supported by appropriate capital market regulation and supervision, work in conjunction with the pension reform to promote financial development. Finally, the coherence of the complete package of macroeconomic policies and structural reforms –both with one another and with the pension reform– probably contribute to growth and to the welfare of the population to an extent that exceeds the sum of the effects of the individual reforms.

## APPENDIX 1

### Data sources and transformations

This appendix presents the sources of the data used in the paper and the main alterations that were carried out on them. The data used in each section are described separately.

#### *Section 2: Characteristics of the reform and the development of the pension system*

The pension fund assets, AFP contributors, and AFP pensioners series were obtained from information issued by the Superintendence of AFPs. How we obtained the series of pension saving flows is explained below (in the explanation of the construction of the data for section 5). The series for contributors and pensioners in the old pay-as-you-go system were derived from information supplied by the Central Bank of Chile.

#### *Section 3: Domestic savings and investment*

The central government deficit series was obtained from the Chilean Budget Office. The operating deficit and recognition deficit series were obtained from Bennett and Schmidt-Hebbel (2001). The total pension deficit was constructed as the sum of the operating deficit and the recognition deficit.

The domestic savings series up to 1997 was obtained from Bennett, Schmidt-Hebbel, and Soto (1999), and it was constructed for the period 1998-2001 on the basis of the National Accounts obtained from the Central Bank of Chile. How we obtained the compulsory saving series is explained below. The voluntary saving and public saving series was obtained from Bennett, Schmidt-Hebbel, and Soto (1999). The domestic investment series was constructed as the sum of the gross fixed capital formation and changes in stock; both were obtained from the Central Bank of Chile.

#### *Section 4: Labor market*

For real interest rates in 1981-2001, we used the rate for indexed 30- to 89-day loans reported by the Central Bank of Chile. For the marginal productivity of capital, we used information from the Central Bank of Chile, and constructed the capital series assuming

a 5% depreciation. For the gross average rate of return of the pension system, we used information published by the Superintendence of AFPs for the gross return and assumed a 2% adjustment for administration expenses.

### Section 5: Capital markets

We constructed the FIR series based on the following information: liquid liabilities: International Monetary Fund (IMF), *International Financial Statistics*; share capitalization: Braun et al. (2000) and *Monthly Bulletins* published by the Central Bank of Chile; private domestic bonds: Cifuentes, Desormeaux, and González (2002) and *Monthly Bulletins* published by the Central Bank of Chile; mortgage bonds: Braun et al. (2000) and *Monthly Bulletins* published by the Central Bank of Chile; difference between M3 and M1: Central Bank of Chile. The above series were deflated using the procedure recommended by Beck, Demirgüç-Kunt and Levine (2000), because of measurement problems arising from the fact that financial variables are measured at year-end, while GDP is measured throughout the year. The authors propose averaging the values of the deflated financial variable from the beginning and end of the year and dividing them by GDP, deflated by an average of the price index. The source for the consumer price index (CPI) series and output is the Central Bank of Chile.

For the mandatory saving series, we used the values reported in Bennett, Schmidt-Hebbel, and Soto (1999), which we extended to cover 1998-2001 using the same methodology as explained in their paper. The construction method consists in adding up only those AFP cash flows that represent compulsory saving and subtracting the flows that represent actual pension payments. Adjustment must be made for the flows that the AFPs transfer to the insurance companies, but which are not paid out immediately to the pensioners as life annuities. In addition, fixed-income assets are adjusted by a normal nominal yield, and dividends paid on share investments are included, whereas capital gains are not. For data regarding AFP flows and their portfolio investments by instrument, we used the *Statistical Bulletins* of the Superintendence of AFPs; for data on life annuities, we used information published by the Superintendence of Securities and Insurance (SVS); for the yield on fixed-income instruments, we used the real market interest rate and the “Unidad de Fomento”

(UF) series, both of which are reported by the Central Bank, as are also the data on dividends.

The financial liberalization index was constructed on the basis of Morley et al. (1999), Lora (2001), and Jeftanovic (1979), and the structural reforms index was constructed on the basis of Morley, Machado, and Petinatto (1999), and Schmidt-Hebbel (2001). The Central Bank's series was used for inflation, revised for the period 1974-1978 based on Cortázar and Marshall (1980). Data from Hachette (2000) were used for total privatized assets as a proportion of the GDP, together with information from various sources for the last few years, including the World Bank and the Treasury. We used autoregressive specifications to obtain the expected returns for the different assets; all the variables included were annual averages. Information on real interest rates came from Braun et al. (2000) and the rate for 30- to 89-day indexed loans is reported by the Central Bank of Chile. For the share return, we used the General Share Price Index (IGPA index), reported by the Central Bank. For the expected return on foreign assets, we used the nominal observed exchange rate of pesos per dollar and the 180-day LIBO rate for dollar operations, both reported by the Central Bank. The real exchange rate was constructed by dividing the sum of the import and export deflators (source: Central Bank) –with a weighting of 0.5 each– by the GDP deflator; to calculate the gap, we subtracted the series adjusted by a Hodrick-Prescott filter. Finally, the Central Bank provided the information used for the savings series.

### *Section 6: Economic growth*

TFP was calculated based on employment data from the National Institute of Statistics (INE) and output and capital data from the Central Bank. The terms of trade variable was calculated by dividing the export deflator by the import deflator (source: Central Bank). For the openness variable, the sum of total real exports and imports was divided by real GDP (source: Central Bank); for work quality, we used the series reported by Chumacero and Fuentes (2000); for the ratio of public spending to GDP, information was provided by the Central Bank; and for the implicit tariff, we used the series reported by Chumacero and Fuentes (2000).



## APPENDIX 2

### Labor markets model

This appendix describes and presents the solution of the model used, which fulfills the conditions described in section 3 and extends the model of Edwards and Cox Edwards (2000, 2002).

Three different wages exist in the formal sector: the gross wage ( $W_F^G$ ), which corresponds to the cost to the firm of hiring a worker; the “valued labor compensation” ( $W_F^P$ ) which is the fraction of the gross wage that workers value as income for their labor; and the worker’s net wage ( $W_F^N$ ). The difference between the gross wage and the net wage in the model is the total contribution to the pension system, while the difference between the net wage and the valued labor compensation is the proportion of the pension contribution that workers perceive as their own income. Consequently, the difference between the gross wage and the valued labor compensation is the pure tax component of the contributions to the system.

The gross, net, and valued wage compensation in the informal sector ( $W_I$ ), under perfect mobility, is equal to the expected value of the valued labor compensation in the formal sector, which in turn is equal to the probability of finding work in the formal sector ( $p$ ) –defined as the number of employees in the formal sector ( $L_F$ ) as a proportion of the employees in that sector and those who are looking for work in that sector (or total unemployment,  $U$ )– times the valued labor compensation in the formal sector ( $W_F^P$ ). Thus,

$$(1) \quad W_I = pW_F^P = \left( \frac{L_F}{L_S + U} \right) W_F^P.$$

This means that the earnings expected from looking for work in either of the two sectors is the same when the model is balanced.

The valued labor compensation in the formal sector is above the equilibrium wage. Its value depends on the slack in the labor market, which corresponds to unemployment plus employment in the informal sector ( $L_I$ )<sup>43</sup>.

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<sup>43</sup> In equation 2, it is assumed that workers in the informal sector will change sectors immediately when the hope of wages in the formal sector increases, and that they will compete under the same conditions as the unemployed.

$$(2) \quad W_F^P F(U+L_I) = F(L_S - L_F)$$

where  $L_S$  is the total supply of labor. This wage curve has its theoretical bases in unemployment models (efficiency wages, search models, and negotiation models). The gross wage in the formal sector ( $W_F^G$ ) is equal to the valued labor compensation plus the contributions to the pension system that represent a pure tax on labor ( $T_P$ ):

$$(3) \quad W_F^N (1+T_P) = W_F^P$$

The demand for work in the two sectors depends on the real gross wage for each sector:

$$(4) \quad L_F^D = L_F^D \left( \frac{W_F^G}{P_F} \right) \text{ and}$$

$$(5) \quad L_I^D = L_I^D \left( \frac{W_I^G}{P_I} \right)$$

where  $L_I^D$  is the demand for labor in the informal sector,  $L_F^D$  is the demand for labor in the formal sector,  $P_F$  is the price level in the formal sector, and  $P_I$  is the price level in the informal sector.

The aggregate price level of the economy is defined as follows:

$$(6) \quad P = P_I^a + P_F^{(1-a)}$$

where  $a$  is the weight of the informal sector's price level in aggregate prices.

The formal sector produces tradable goods, so the price level in that sector is determined externally, whereas prices in the informal sector depend on the wages in that sector:

$$(7) \quad P_F = C$$

where  $C$  is a constant, and

$$(8) \quad P_I = P_I(W_I)$$

where  $d \ln P_I / d \ln W_I < 1$ .

The total labor supply depends on the valued labor compensation expected from entering the work force, which corresponds to the wage in the informal sector<sup>44</sup>. The total labor supply can be broken down into employment in the formal sector, employment in the informal sector, and unemployment, which corresponds to people seeking work in the formal sector:

$$(9) \quad L^S = L^S \left( \frac{W_I}{P} \right) \text{ and}$$

$$(10) \quad L^S = L^F + L^I + U$$

This model introduces the following two modifications to the Edwards and Cox Edwards (2000, 2002) model. The main change is related to the process of wage fixing in the formal sector. These authors assume that there is a net wage that is fixed, due to the imposition of a minimum wage that affects all workers in the sector. This implies that the change in system causes a reduction in the contribution rate (the gross wage falls and the net wage remains the same) instead of a reduction in the tax component of the contributions. Since the net wage does not change, there are increased effects on employment in the formal sector, stemming from a fall in the pure tax component of the system. In the model used in our study, a differentiation is made between the gross wage, the valued labor compensation, and the net wage, without assuming that any of these is fixed exogenously.

The second modification was introduced in the labor supply. Edwards and Cox Edwards (2000 and 2002) assume that the labor supply depends on a weighted average of the wages in the two sectors, but they do not adjust for the probability of being unemployed and having no income. Here, we adjust for that probability, and the supply depends on the expected wage, which is the same in both sectors:  $W_I$ . In other words, an increase in employment in the formal sector will encourage an increase in the

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<sup>44</sup> Under condition (1), the expected wage in the formal sector is equal to the wage in the informal sector, because there is a probability of becoming unemployed. The aim of entering the work force may be to seek work in the formal sector, in which case the expected wage is  $W_I$ , or to accept work in the informal sector, in which case the expected wage is also  $W_I$ .

labor supply by raising the level of expected wages. This implies a greater response of the supply to the fall in the pure tax component in expected wage levels, which brings down wages and increases employment in the two sectors.

The labor market equilibrium in our model is depicted in diagram 1. Panel A shows the initial equilibrium in the formal sector, which is determined at the point where the difference between the labor demand curve ( $L_F^D$ ) and the initial wage curve ( $W_F^0$ ) is equal to the amount of the pure tax component of the contributions ( $T_0$ ). The panel shows the three wages:  $W_F^P$  corresponds to the workers' valued labor compensation;  $W_F^G$  represents the unit labor cost for the firm; and  $W_F^N$  is the net wage. Firms hire  $L_F^0$ , the number of workers at which the marginal productivity of labor equals the cost to the firm of hiring a worker.

Panel A could also be used to graphically illustrate the total labor supply, which would intersect labor demand at a point below the intersection of labor demand and the wage curve. The assumptions of the model imply that the wage in the formal sector will always be above the market equilibrium wage, even if there is no contribution to the pension system, as indicated by the models of involuntary unemployment mentioned above. Panel C identifies the initial labor level ( $L_S^0$ ) at the intersection between the labor supply curve and the expected wage on entering the labor market. The latter is equal to the prevailing wage in the informal sector, which is always less than the wage in the formal sector. The informal wage is determined by the formal wage and the quantity of unemployment and employment in the informal sector<sup>45</sup>. Since the informal wage is lower than the valued labor compensation in the formal sector, the labor supply is greater than employment in the formal sector; the difference between the two corresponds to employment in the informal sector and unemployment (the slack in the labor market).

Panel B depicts equilibrium in the informal sector, which is determined by the intersection of the sector's demand for labor ( $L_I^D$ ) and its wage level ( $W_I$ ), which is determined together with

<sup>45</sup> By assuming that the formal sector wage depends not only on the extent of unemployment but also on employment in the informal sector, we assume that these workers will change sectors if there is any increase in the expected wage in the formal sector and thus will compete with the unemployed for a space in that sector.

the wage level in the formal sector<sup>46</sup>. The supply of labor in the informal sector is completely elastic and shifts every time the wage in the informal sector changes, such that it completely fills the demand at that wage level.

The effects of the pension system reform on the labor market are as follows. The improvement in the relation between contributions to the system and benefits obtained in retirement gives rise to a decrease in the pure tax component of the contribution, which produces a decrease in the gross wage and an increase in the valued labor compensation in the formal sector<sup>47</sup>. The fall in the gross wage in the formal sector causes an increase in employment in that sector by reducing marginal hiring costs. The informal wage also increases because of the exodus of workers to the formal sector following the rise in the expected valued labor compensation in that sector<sup>48</sup>. The wage curve moves to the left as a result of the increased employment in the formal sector, which partially counteracts the above effects on wages and employment. However, the increase in the informal wage, which reflects the increase in the expected value of entering the work force, means an increase in the labor supply, producing a downward shift in informal wages, formal wages (gross and net) and the wage curve, with a positive effect on employment in both sectors. Finally, prices in the informal sector increase as a result of the increase in the informal wage; this partially counteracts the effects on the labor supply, even though they increase the quantity of hired labor in the informal sector.

The results are shown in diagram 1. Panel A indicates that employment in the formal sector increases initially ( $L_F^1$ ) and that the valued labor compensation increases ( $W^V_1$ ) and the gross wage decreases ( $W^B_1$ ) as the pure tax decreases ( $T_2$ ). Panel B shows that informal employment falls initially due to the

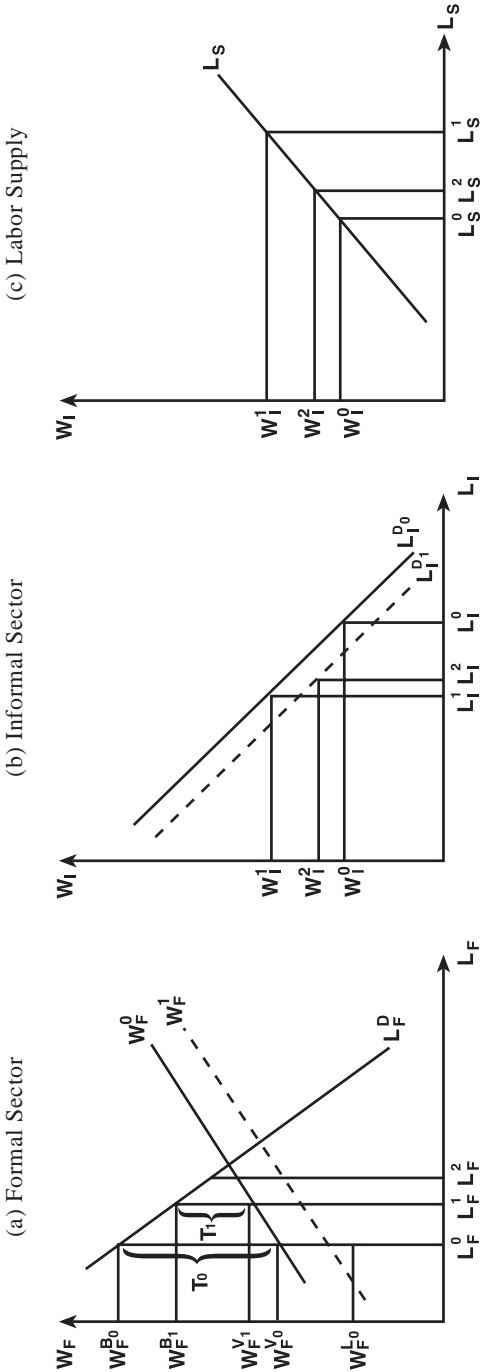
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<sup>46</sup> The formal sector wage depends on the demand for labor in that sector and the wage curve, which in turn depends on the level of unemployment and employment in the informal sector, which are determined on the basis of the informal wage. The informal wage, however, depends on the level of wages and unemployment in the formal sector.

<sup>47</sup> The change in the net wage depends on the change in total contribution rates. If these fall, the net wage will also fall, though to a greater extent because of the fall in the gross wage.

<sup>48</sup> The increase in the expected wage is produced by the increase in the valued labor compensation in the formal sector and by the decrease in unemployment and, correspondingly, in the probability of finding work in the formal sector.

**Diagram N° 1**  
**EQUILIBRIUM IN THE LABOR MARKET**



increase in the expected value of transferring to the formal sector ( $L_I^1$ ). This also produces an increase in the supply of labor ( $L_S^1$ ), however, which causes a fall in wages and an increase in employment in both sectors, so that the wage curve in the formal sector shifts right. The panel also illustrates the fall in the demand for labor in the informal sector due to the rise in the price level in the sector, which in turn results from the increase in the informal wage. Once again, this reduces employment at the level of wages that has already been determined in that sector. Finally, panel C shows that the work force initially increases in response to the increase in expected wages, but this first effect is then counteracted by the new fall in wages. In addition, the increase in the price level means that the supply shifts to the left, partially counteracting the initial effects on the work force. (This latter movement is not shown in the figure, nor are any of the second-round effects.)

The analytical solution of the model set out in equations 1 through 10 is presented below. First, the solution for the change in the formal net wage and in the informal wage is determined in the following system of equations:

$$(11) \quad d\ln w_F^N = \frac{\delta}{L_S - L_F + \delta \eta_F L_F} \left[ \phi L_S d\ln w_I (1 - \gamma \theta) - \eta_F L_F d\ln T \frac{T}{1 + T} \right]$$

$$(12) \quad d\ln w_I = \frac{(1 + \eta_F) d\ln w_F^N + d\ln T \frac{T}{1 + T} \eta_F}{1 + \frac{L_S}{U + L_F} \phi (1 + \gamma \theta) - \frac{L_I}{U + L_F} \eta_I (1 - \theta)}$$

where  $\delta$  is the elasticity of the net wage in the formal sector relative to the unemployment level,  $\eta_F$  is the elasticity of labor demand to the gross wage in the formal sector,  $\phi$  is the elasticity of the labor supply to the real wage,  $\gamma$  is the weight of the informal sector price level in the average price level of the economy,  $\theta$  is the fraction of the increase in the informal wage that is reflected in an increase in the price level in that sector, and  $\eta_I$  is the elasticity of labor demand to the informal wage. Once the values have been found for the change in the formal net wage and in the informal wage, the rest of the variables are calculated as follows:

$$(13) \, d\ln w_F^B = d\ln w_F^N + d\ln T \frac{T}{1+T}$$

$$(14) \, d\ln w_{L_F} = \eta_F d\ln w_F^G,$$

$$(15) \, d\ln L_I = \eta_I d\ln w_I,$$

$$(16) \, d\ln L_S = \phi (1 + \gamma\theta) d\ln w_I, \text{ and}$$

$$(17) \, d\ln L = \frac{L_F}{L_S + L_F} d\ln L_F + \frac{L_I}{L_I + L_F} d\ln L_I.$$



## APPENDIX 3

### Calculation of effects on labor productivity

To measure the effects of employment relocation on productivity, we used the net flow of workers, as no information is available on gross flows. The net flow comprises two components: i) the increase in total employment, which represents workers who had no productivity at all and now have the productivity of the formal sector, and ii) the decrease in informal employment, which represents workers who had the productivity of the informal sector and now have that of the formal sector<sup>49</sup>.

The effect on productivity of the first component is accounted for almost entirely by adding the net change in employment to the production function (this calculation is made in section 6.2 in the text). There, the effect on output is the increase in labor, multiplied by the mean labor productivity in the economy and weighted by participation. However, these new workers do not have the mean productivity of the economy, but rather the mean productivity of the formal sector. It is therefore necessary to add a correction term equal to the difference between the mean productivity of the economy and the mean productivity of the formal sector, times the number of net jobs created in the economy (which are all formal) and weighted by labor's share in total output.

The effect on productivity of the second component is not accounted for in section 6.2, because the labor series used in the production function includes formal and informal employment. The effect on productivity of this flow must be calculated as the number of workers leaving the informal sector –which is less than the number of workers entering the formal sector– times the productivity differential between formal and informal workers and weighted by labor's share in total output.

To estimate the effect on GDP, we use a labor participation of 0.6 in the Cobb-Douglas production function used in section 6.2. This change in GDP is found as the sum of the output of the net

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<sup>49</sup> This method classifies in the first group any worker who transfers from the informal to the formal sector and is replaced in the informal sector by a worker entering the work force; the calculations do not divide gains into creation of formal employment, creation of informal employment, and formalization of labor.

employment flows in each sector and the corresponding gains in productivity, adjusted by the share of labor in GDP:

$$dY_t = 0.6 [(Y_t/L_t)^F - (Y_t/L_t)^E] dL_t^T + 0.6 [(Y_t/L_t)^I - (Y_t/L_t)^F] dL_t^I$$

where  $dY_t$  is the additional change in GDP from the increase in total employment and formalization,  $(Y_t/L_t)^F$  is the average productivity of labor in the formal sector,  $(Y_t/L_t)^E$  is the average productivity of labor in the economy,  $dL_t^T$  is the net increase in total employment,  $(Y_t/L_t)^I$  is the average productivity of labor in the informal sector, and  $dL_t^I$  is the change in employment in the informal sector.

To find these effects, we use data from García (1995). The idea is to apply García's estimates of mean productivity to each sector before and after the reform and calculate the rate of change in total output<sup>50</sup>. We believe that almost all the effect on labor markets has already taken place in Chile. The active workers who are still enrolled in the old system are almost entirely members of the armed forces and the police force, who remain in the formal sector. We therefore assume that this discrete change, which appears in the theoretical model, has occurred gradually but almost completely in Chile, as a function of the transfer of workers from the old system to the new.

García (1995) defines secondary employment as the sum of self-employed workers and family members who work without pay in the nonagricultural sector, and defines primary employment as all other nonagricultural workers. The employment estimates for 1980 are consistent with those used in the simulation of the model for segmented labor markets, defining the formal sector as the primary sector and the informal as the secondary sector plus agricultural workers. The author estimates the formal and informal output series using the following assumptions: workers in the secondary sector

<sup>50</sup> We attempted to measure the effects of the formalization of labor on productivity by introducing a variable defined as the system's pure tax component times the ratio of active members in the new system to the total number of active members, in an equation explaining total factor productivity. The variable was not significant, however. There may be a problem owing to the fact that the annual effect is too small to be picked up by the equation, or the problem could lie in the construction of the variable, given the small amount of pre-reform data on average contribution rates in the pension system.

have the same mean productivity of all sectors of the economy, and the two types of workers (primary and secondary) have the same mean productivity in the commercial sector. Secondary output is therefore obtained by multiplying the number of informal workers by the mean productivity of the commercial sector (which has independent data for output and employment), while primary output is obtained from the difference between total output, on the one hand, and agricultural output and secondary output, on the other. For the agricultural sector, mean productivity is based on data for GDP and agricultural employment. These figures allow us to estimate mean productivity levels for the three sectors.

The results in García (1995), averaged from 1981 to 1996, suggest that the mean productivity of the secondary sector is equivalent to 73% of the mean productivity of the primary sector and that the mean productivity of the agricultural sector is 26% of the mean productivity in the primary sector. According to these calculations, the mean productivity of the informal sector –defined as the sum of the secondary and agricultural sectors– corresponds to 49% of the mean productivity of the formal sector, while the mean productivity of the economy equals 79% of the mean productivity of the formal sector.

## APPENDIX 4

### Description of the estimated equations of financial deepening

Taking the estimate of the equation shown in the text as our starting point, we estimated a series of alternative specifications to test the robustness of the results and find a value for the parameter relating the pension reform with financial development. Table 10 shows the results of the estimates. Equation 1 includes all the control variables already mentioned, and the effect of the pension saving is seen to be quite significant. The variables for critical levels of inflation are also quite significant, as are privatized assets as a proportion of the GDP. These results hold for the rest of the equations. The financial liberalization index appears with the opposite sign, most probably because of the high degree of correlation between this variable and the rest of the structural reforms. The total savings coefficient is not significant and has the opposite sign, which is probably also explained by the correlation with the structural reform variables. None of the variables for expected returns are significant with the exception of the expected return on bonds, which nonetheless appears with the opposite sign. The return on money may also be picking up the negative effects of higher inflation on financial development<sup>51</sup>. The problem with these variables is that they are endogenous to financial development, and although they were constructed on the basis of expected values for the following periods given the available information in each period, it is difficult to model expected values in annual series. The equation cointegrates at the 5% level of significance according to the values in the McKinnon tables; this result is repeated in all the equations with complete specifications (equations 1 through 13 and 18 through 22).

After verifying in equations 2 through 8 that the problems with portfolio variables are not due to particular specifications, we eliminated them from the estimates. We also verified that the signs for the reform indices were correct when introduced separately.

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<sup>51</sup> The expected rate of return on money is defined as expected inflation divided by one plus the negative of expected inflation. We checked the possibility that the return on money was picking up the effect of inflation and not a portfolio effect (as in Impávido and Musalem, 2000), introducing the inflation rate as an additional independent variable. The result was not significant.

Total saving has the opposite sign and is not significant, so it is left out in the next estimates<sup>52</sup>. One relevant result for the different specifications is that in addition to there being a cointegration vector that has a 95% confidence level in all the specifications, the effect of the flow of pension savings remains highly significant and shows no important differences in value.

Equation 10 only includes the variables that are significant and have the expected sign. The financial liberalization index is not included because it appears with the opposite sign in equation 9, due to the correlation with the privatization variable. This is verified in equation 11. In equation 10, the estimated parameter for the effect of the pension reform on financial development has a value of 7.9, which implies that 31% of the increase in FIR from 1980 to 2001 is explained by the existence of the new private pension funds.

In equations 11 and 12, the variable that accounts for privatizations as a proportion of the GDP is replaced by the financial liberalization and structural reform variables, respectively. The cointegration is maintained in those equations, but the value of the parameter that reflects the effect of pension saving flows on financial development rises to 11.7. This is surely due to the fact that when a variable that is important for financial development is omitted, any related variables include its effects. There may also be a complementary effect between the two policies, such that using privatized assets as a control may result in underestimating the effect of the pension funds<sup>53</sup>. Equation 13 includes total saving and confirms that the problem in the initial equations was their correlation with the privatization variable, although its significance remains low. In any case, the effect of mandatory saving was shown to be stronger and more significant than the total saving in the economy. On the basis of the parameters estimated in equation 11, which are similar to the values estimated in equations 12 and 13, the existence of the private pension funds explains 46% of the financial development between 1980 and 2001.

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<sup>52</sup> Total saving is reintroduced in equation 13, where it is shown that the sign problem occurs at least because of the correlation with the privatized assets variable.

<sup>53</sup> The equations include an interaction term between the two variables, which is significant and has a positive sign only when the privatizations-to-GDP variable was excluded from the specification. Interaction terms between the flow of pension savings and the indices of structural reforms were also included, but proved not to be significant.

Equations 14 through 17 show that the parameter for the pension reform's effects grows even more when the variables for inflation and other structural reforms are left out. However, in these equations there is no cointegration relation at the 10% significance level.

Finally, in equations 18 and 19, a sensitivity exercise was carried out on the dependent variable. In equation 18, the difference between the monetary aggregates M3 and M1 is included in FIR (excluding liquid liabilities), and in equation 19 public bonds are excluded from FIR. The personal saving parameter is lower (relative to equation 10), but the change of dependent variable for the period 1980-2001 has the same effect. For the FIR variable that includes the difference between M3 and M1, the existence of the pension funds contributed 23% to its development for the period, while for the FIR variable that excludes public bonds, it contributed 29%.

A final sensitivity exercise was carried out by replacing the variable for mandatory savings flow in the new system with a variable for the stock of pension assets. For the latter, the value of the pension funds' assets could be used, but we believe that this is not an appropriate means of measuring the stock because it includes supranormal capital gains and flows of savings from voluntary accounts, but does not include funds transferred from the AFPs to insurance companies in the form of life annuities that are not yet paid to pensioners. The flow of pension saving used corrects for these problems, and so the pension stock variable used for the simulation exercise is the accumulated value of this saving as a proportion of GDP. (The problem with this variable is that there may be specific errors in the construction of the flow of pension saving, which may have non-specific effects in the accumulated value.)

The results may be seen in equation 20 of table 9. The estimated parameter for the stock of pension system assets is 0.9, which implies that the existence of this stock explains 33% of the financial development between 1980 and 2001. The value estimated in equation 10, which is the appropriate equation to use for comparison, indicates a contribution of 31%. The problem with this equation is that there is no cointegration vector for traditional levels of confidence.

## APPENDIX 5

### Description of the estimated equations of total factor productivity

The specification given in the text is used as the basis for estimating seventeen equations to determine the magnitude of the relation between financial development and the TFP, together with the degree of robustness. The results of the most important estimates are presented in table 12. The aim is to undertake a sensitivity analysis with different variables that can incorporate information about the relation between financial development and TFP in long-term equations. Equation 1 includes all the variables except the linear trend; the most important variables are FIR, the terms of trade, and openness, a result which is repeated in the remaining equations. The coefficients for the structural reform index and the inflation variable have the expected signs but are not significant, while the coefficients of public spending, the labor quality index, and the implicit tariff are not significant and have the opposite sign. The coefficient of public spending as a proportion of GDP acquires the expected sign when we control for the level of public spending, so it may be picking up cyclical effects from the beginning of the sample<sup>54</sup>. The coefficients of the other two variables –the labor quality index and the implicit tariff– appear with the opposite sign due to their correlation with the openness variable, which is confirmed in equations 13 and 14.

These variables are eliminated in equations 4 and 5, and the structural reforms index and inflation variable remain non significant. In equation 6, only significant variables are included. A linear trend is added in equation 7; it turns out to be negative and not significant. Equation 8 examines whether inflation is not significant because of its correlation with the structural reforms index, but this turns out not to be the case. The range for the estimated parameter relating financial development and TFP growth is quite small, while all the equations cointegrate at the 5% level of significance, according to McKinnon values.

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<sup>54</sup> The equation that includes the level of public spending is not included in the results because we believe that it has no theoretical justification. In addition, public spending as a proportion of GDP remains insignificant.

In equation 9, the openness variable is excluded and the estimated parameter for FIR doubles. These results are repeated through equation 14, in which the range for the estimated parameter is again limited, though it remains greater than in the previous equations; the equations cointegrate with at least 10% significance according to McKinnon values. Obviously the increase in the parameter is explained by the possible correlation between the omitted variable (that is, openness) and the other independent variables. There may be an additional reason, however: one of the channels through which financial development acts on the growth of the economy may be the “financing” of greater openness, a process in which the pension system reform may have played an important part<sup>55</sup>. If so, the range of the initial equations may underestimate the real effect, and the range of the final equations may overestimate it. Once again the trend variable is not significant and does not have any important effect on the estimated parameters<sup>56</sup>. In equations 15 through 17, in which the range for the effect of FIR is broader, there is no cointegration vector for acceptable levels of confidence. These equations are only presented to justify the importance of the terms of trade variable—which, if omitted, renders negative the structural reform variables—and the reform and openness variables<sup>57</sup>.

Finally, we tested for possible complementary effects between the different reform indices and the financial variable, but these were never significant (results not reported). In any case, the reforms variable already includes the effects of complementary policies.

Other financial variables used in the most recent empirical studies on the subject were also employed to check whether FIR is the most appropriate variable. Individual tests were carried out on liquid liabilities, credit to the private sector, the turnover ratio, value traded, and share capitalization. The results (not reported) show that share capitalization is slightly more significant

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<sup>55</sup> Rousseau and Sylla (2001) find that financial development made a positive contribution to the trade openness variable and to financial integration, by producing a convergence of interest rates.

<sup>56</sup> This means that TFP growth is well modeled with the independent variables used. Thus the exogenous per capita growth rate of theoretical growth studies would be endogenous here for the sample 1960-2001. In the future, when the independent variables have become stationary, new sources will be needed if total factor productivity is to continue to grow.

<sup>57</sup> This variable is highly correlated with the reform index.



statistically when introduced individually, but, theoretically, we believe that it does not capture total financial development, which is the measure we use to infer the effect of the pension reform. Given that we work with time series, it is very difficult for two financial variables to enter significantly in the equations, in view of their high degree of correlation. The correlation between share capitalization and the other components of FIR is 0.9. Obviously, since these are components of FIR and the correlation among them is high, the correlation between FIR and capitalization to GDP and between FIR and the other variables included in FIR is close to one. The correlation between FIR and value traded, between FIR and the turnover ratio, between FIR and private credit, and between FIR and liquid liabilities is 0.91, 0.7, 0.8, and 0.87 respectively.

## APPENDIX 6

### Calculation of the effect of the pension reform on GDP in 2001

This section explains the procedures used to derive the average 1981-2001 growth due to the pension reform, distinguishing the various reform effects and the derived rise in the level of GDP in 2001. These are summarized in table 13. The starting point for the calculations in each section was the following equation:

$$(1) \quad Y_{01} = Y_{80} (1 + g_{PR}^T)^{21} (1 + g_{OR})^{21} = Y_{80} (1 + g_T)^{21}$$

where  $Y_{01}$  is the GDP level in 2001,  $Y_{80}$  is the GDP level in 1980,  $g_{PR}^T$  is the average growth rate of the economy that can be attributed to the pension reform (including the effects on investment, the labor market, and financial development),  $g_{OR}$  is the average growth rate of the economy that would exist if the reform had not been implemented, and  $g_T$  is the total average growth rate that actually occurred in the economy. All these average growth rates correspond to the period 1981-2001.

Section 6.2 in the text includes an estimate for the output series that would have existed without the effects of each of the channels that were studied in the previous sections. For the case of investment, the estimate of the GDP series was made using lower levels of investment, consistent with the different scenarios suggested in section 3; for the case of labor, the estimate of the output series was made on the basis of what would have happened if employment had grown at the rates that would have prevailed without the reform; and for total factor productivity, the estimate of the GDP series was based on what would have happened if the FIR variable had not had the input supplied by the reform through the mandatory savings variable estimated in section 5.2. Using equation 1 for each individual component of the reform, we have:

$$2) \quad Y_{01} = Y_{80} (1 + g_{PR}^i)^{21} (1 + g_{REST}^i)^{21} = Y_{80} (1 + g_T)^{21}$$

where  $g_{PR}^i$  is the average growth rate attributable to each individual effect of the pension reform (the superscript  $i = S$  for the profits produced through the effects on savings and investment,  $i = L$  for the effects produced through the labor markets, and  $i = F$  for the effects of financial development on TFP);  $g_T$  is the total average

growth rate of the economy, and  $g_{REST}^i$  is the growth of the series without each individual effect of the reform. That is,  $g_{REST}^i$  includes not only the growth rate without reform, but also the growth rates produced by reform effects other than  $i$ . Once the average growth rates were calculated without each of the reform effects, the growth rates attributable to each individual effect on growth, as reported in table 13, were calculated in the following way:

$$(3) \quad g_{PR}^i = \frac{1 + g_T}{1 + g_{REST}^i} - 1$$

Thus, the total average growth rate attributable to the reform ( $g_{PR}^T$ ) is defined as

$$(4) \quad g_{PR} = (1 + g_{PR}^S) (1 + g_{PR}^L) (1 + g_{PR}^F) - 1.$$

In this equation,  $g_{PR}^T$  includes the effects of interaction among the different individual effects produced by the reform, which is not included in the individual average growth rates.

To estimate the effects of the different channels of the pension reform on the output level, we defined the following terms:

$$(5) \quad 1 + (EA_{PR}) = (1 + g_{PR}^T)^{21} \text{ and}$$

$$(6) \quad 1 + (EA_{OR}) = (1 + g_{OR})^{21},$$

where  $EA_{PR}$  and  $EA_{OR}$  are the output gain attributable to the pension reform and the output gain attributable to other sources of growth, respectively (as explained below,  $EA_{OR}$  is not equal to the output gain that would have existed without the reform). Replacing equations 5 and 6 into equation 1 we have:

$$(7) \quad Y_{01} = Y_{80} (1 + EA_{PR}) (1 + EA_{OR}) \text{ and}$$

$$(8) \quad Y_{01} = Y_{80} (1 + EA_{PR} + EA_{OR} + EA_{PR} \times EA_{OR}).$$

In other words, the difference between the level of GDP in 2001 and the level of GDP in 1980 can be decomposed into an output gain attributable only to the pension reform ( $EA_{PR}$ ), an output gain attributable to other sources of growth ( $EA_{OR}$ ), and an output gain attributable to the interaction between the pension reform and the rest of the factors that caused the economy to grow ( $EA_{PR} \times EA_{OR}$ ).

Although this last term would be zero if the pension reform had not existed, 100% cannot be attributed to the reform, since the term would also be zero if there had been no other source of growth in the economy. For example, if the rest of the growth in the economy had occurred because of other reforms, attributing the interaction gain entirely to the pension reform would mean we were underestimating the effect of the other reforms, which also contributed to the interaction gain. So, if we calculate the output gains attributable to the pension reform by clearing  $EA_{PR}$  in equation 7 or 8, as follows,

$$(9) \quad EA_{PR} = \frac{Y_{01}}{Y_{80} (1 + EA_{OR})} - 1,$$

then we calculate the difference between the output that existed with the reform and the output that would have existed without the reform –and without the gains accumulated through the interaction with the reform– as a proportion of the latter. We thus attribute 100% of the interaction term to the pension reform. As mentioned above, however, we are overestimating the effects here, because it is incorrect to attribute all the gain resulting from interaction between sources of growth to one individual reform. This becomes clear if we estimate the gain resulting from other sources of growth:

$$(10) \quad EA_{OR} = \frac{Y_{01}}{Y_{80} (1 + EA_{PR})} - 1.$$

If we define equations 9 and 10 as a function of GDP in 2001 and then add them together, we have

$$(11) \quad EA_{PR}^{01} = \left[ \frac{Y_{01} - Y_{80} (1 + EA_{OR})}{Y_{80} (1 + EA_{OR})} \right] \times \left[ \frac{Y_{80} (1 + EA_{OR})}{Y_{01}} \right],$$

$$(12) \quad EA_{OR}^{01} = \left[ \frac{Y_{01} - Y_{80} (1 + EA_{PR})}{Y_{80} (1 + EA_{PR})} \right] \times \left[ \frac{Y_{80} (1 + EA_{PR})}{Y_{01}} \right], \text{ and}$$

$$(13) \quad EA_{PR}^{01} + EA_{OR}^{01} = \left( \frac{Y_{01} - Y_{80}}{Y_{01}} \right) \times \left( \frac{Y_{01} EA_{PR} EA_{OR}}{Y_{01}} \right).$$

In equation 13, the sum of the two components accumulated on the basis of GDP in 2001 overestimates the total difference in

the output gain from the interaction term. This is due to the fact that each term for accumulated gain awards the interaction gain to itself.

To divide the interaction effects among the sources of growth, we used the following criteria: each source of growth collaborates with the interaction term in accordance with the importance of each one of them *vis à vis* the growth rates. First, we defined the following term:

$$(14) \quad EA_{RP-INT}^{01} = EA_{RP}^{01} - (EA_{PR} \times EA_{OR})^{01} = EA_{PR}^{01} - (EA_{PR} \times EA_{OR}) \frac{Y_{80}}{Y_{01}},$$

where  $EA_{RP-INT}^{01}$  is the output gain produced by the pension reform excluding the terms of interaction with other sources of growth, adjusted so as to express them in terms of GDP in 2001  $(EA_{PR} \times EA_{OR})^{01}$ . We then defined the reform contribution (RC) as

$$(15) \quad RC = EA_{RP-INT}^{01} + \left[ \frac{g_{PR}}{g_{PR} + g_{OR}} (EA_{PR} \times EA_{OR}) \frac{Y_{80}}{Y_{01}} \right]$$

In other words, we added the direct effects of the reform as a proportion of GDP in 2001 and as a proportion of the interaction term, according to the importance of the pension reform relative to the rest of the reforms. This last term is multiplied by the ratio of GDP in 1980 to GDP in 2001 to express it as a proportion of the latter year.

Finally, the average growth rates attributed to the individual effects of the reform and reported in table 13 do not include interaction effects with the other individual growth rates attributable to the reform. These interaction effects occur among the different components of the reform, and thus, unlike interaction terms between this reform and other reforms, they have to be attributed entirely to the former. So, to find the accumulated output gains from the individual effects of the reform, the interaction term of the reform –defined as the difference between the accumulated sum using the average rate attributable to the total reform, which does include interaction terms, and the sum of the accumulated individual effects of the reform calculated in the individual growth rates– is distributed among the different sources in proportion with their importance relative to the total reform effects. Consequently, the accumulated gain (as a proportion of

GDP in 2001) from the individual effect of the reform on TFP in the intermediate case (2.17% of GDP) is greater than the total accumulated effect of the lower-bound case (1.92% of the GDP), while the average growth rate of the former (0.2%) is lower than that of the latter (0.22%) (see table 13). On calculating the accumulated effect on TFP in the intermediate case, an interaction term is added with the rest of the individual effects of the reform, which does not happen in the transformation of the total average rate because this already includes such effects.

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# COMMENTS

MAURICIO GONZÁLEZ<sup>1</sup>

This article will offer a few comments and annotations on Dr Schmidt-Hebbel's paper, briefly underlining the most interesting points in this excellent piece of work. It will also treat a few of the benefits that are already being seen in the case of the pension reform in Mexico.

Dr Schmidt-Hebbel's presentation is an extremely comprehensive piece of research and it would be difficult to ask for greater academic thoroughness than that shown in his document, in a paper on this or indeed any other subject. It speaks clearly of the importance of a pension system based on individual capitalization, not only for savings but also for investment, for the development of the capital market, for the behaviour of employment in both the formal and informal sectors and for the productivity of factors of production.

What may well be of greatest interest is the enormous stock of empirical evidence that he produces regarding the possible effects of the modern pension systems on the large economic aggregates.

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<sup>1</sup> Director General of the Group of Economists and Associates (GEA), of which he was co-founder. He is advisor to the AFORE Santander, Grupo Corvi, Tepeyac Insurance Company, the Bancomext Risk Committee and the Investment Committee of Ixe. He is an Economist of the Instituto Tecnológico Autónomo de México (ITAM) with a Master's degree in Economics from the University of Chicago, USA, where he is also candidate for a doctorate. He has been coordinator of the finance area in the Business School of the ITAM and has taught various subjects at that institution. He has also taught a number of courses at the Centro de Estudios Monetarios Latinoamericanos (CEMLA), the Instituto Nacional de Administración Pública (INAP) and the Universidad Iberoamericana (UIA).

Experience indicates that the people who implement public policy, who are in the situation of reforming or improving pension systems in one or other of our countries, are almost always in a position where the information is very unbalanced. First, there is an abundance of “buts”, obstacles and difficulties that have to be overcome in order to launch or extend the pension reform, and there is very often little knowledge of the benefits implied in a pension reform, over and above the conceptual or theoretical aspects. This means that in debates on pension system reforms, everything becomes more complicated, long-drawn-out and difficult than necessary.

This piece of research by Dr Schmidt-Hebbel provides us with a document which may well become an obligatory reference-point for all those in search of a scientific, objective and quantified appraisal of what we consider to be the pioneer of modern pension systems, the case of Chile. And although he makes it quite clear that this evidence corresponds to the case of one country –in view of the characteristics that pension reforms have had in other places– it could quite safely be used as a point of reference.

When reading Dr Schmidt-Hebbel’s paper, it is possible in most sections to identify elements on which comments could be made. However, on continuing to read, there is a surprise in store –a pleasant one– because Dr Schmidt-Hebbel has expanded on these aspects a couple of pages later.

In any case, it is important to go into certain subjects in more detail, though perhaps in a slightly different order from the one that he used in his paper. The first part will deal with what are known as the traditional or better-known points, where there is more literature and evidence. These are perhaps the effects of pensions on saving and on the development of the capital market. Then a few comments will be made on aspects such as the effect of the pension reforms on employment, productivity and economic growth as a whole, for which there is less evidence and literature, thus making the contribution of what has been presented to us perhaps even more valuable.

Here, then, are some brief comments and a few suggestions on each of those topics.

As regards saving, this paper is undoubtedly extremely relevant, in various aspects. In the first place, it clears away certain questions

which occasionally arise in literature on the subject, about the effect of pensions on internal saving. Dr Schmidt-Hebbel's research finds a positive relationship between pension reforms and internal saving, in other words, national saving, in the case of Chile.

Here it is necessary simply to mention, not for the sake of repetition but rather to highlight those matters that seem extremely important, that in the first place the Chilean population in general has reacted to the dissaving effect which has occurred in the public sector and which is a natural part of reform processes. It is precisely one of the detonators which produce pension reforms. In the Chilean population –even though the reasons for reacting in this way are not entirely clear– there has been an increase in private saving with a coefficient of 0.5. For each percentage point decrease in public saving, the population has reacted and increased its saving, thus compensating this situation which occurs in pension reforms.

The population is responding by half of what one would expect according to Ricardian equivalence, as Dr Schmidt-Hebbel clearly explains, but, in any case, the point is that the populace does not remain passive when these reforms are introduced to increase saving. This is one of the important factors and, according to the figures, one with considerable quantitative weight in increasing saving. We know from his document that this is one of the pivots on which macroeconomic benefits are established, because the greater the amount of saving that can be produced, the greater the productive investment, and that in turn leads to greater economic growth, as he explains clearly in this section.

However, another striking point made in this piece of work is that both the authorities of various countries and the pension administrators consider the increasing of voluntary savings to be a desirable objective. Some documents point out that the voluntary savings component is one on which many hopes are pinned, with a view to broadening the scope of the benefits of the pension reform.

In Chile's case, Dr Schmidt-Hebbel shows us that the mandatory saving derived from the reform itself, the increase in contributions or the pension contributions themselves, tends to decrease voluntary saving. We therefore find a situation in which the actors inside the pension market, the administrators and the authorities themselves, who are interested in creating better replacement rates

for the pensioners, should possibly have recourse to voluntary saving. However, observations indicate that the mandatory savings component encourages a tendency for people to decrease that voluntary saving. Here, then, is a call to redouble our efforts because, if we really wish to increase replacement rates by means of greater voluntary contributions, this is not simply going to happen automatically. We will have to work very hard at this attempt if the coefficients that have occurred in Chile's case are repeated in other countries.

The paper also provides very valuable evidence on how the increase in internal saving affects the growth in productive investment and how that in turn causes the economy to grow more.

In this document, Dr Schmidt-Hebbel chooses an equation which, –to use his own words– he calls a simple equation. In it he attempts to link the quotient of productive investment to the gross domestic product, as a function of the quotient of saving over the gross domestic product, and determines that the relation between the two variables is positive and, as was mentioned before, 0.5. In other words, for each unit of increase in the coefficient of saving over gross domestic product, inflation increases by half the percentage increase of the former.

Here it is worth bearing in mind that, precisely because this relationship is relatively simple, it may be important to investigate the causes a little further and discover whether it is saving that fosters greater productive investment or productive investment in its turn that is generating more saving. It would seem that an open door exists for fine-tuning this estimate, making it possible to state with greater certainty the potential effect of the increase in saving derived from pension reform on the performance in productive investment.

In the second aspect, that concerned with the development of the capital market, Dr Schmidt-Hebbel provides convincing evidence of the pension reform's contribution to increasing financial depth. He finds that between 31% and 46% of the increase in the relationship between fixed assets and gross domestic product, which is how financial depth is measured, is due to the pension reform, and he emphasizes at the same time that there is a series of benefits attached to this deepening process. He indicates on the one hand the improvement in corporate governance in the bodies

issuing the financial securities demanded by the pension administrators themselves, and on the other, the creation of new financial instruments, also as a result of these participants in the market which tend in the long term to become majority participants.

Dr Schmidt-Hebbel has made an excellent job of quantifying when he writes of how the volume, for want of a better word, of the money and capital markets grows in the presence of the pension reform. But there would appear to be room to broaden the investigation, not so much to the effect on volumes or on the size of the financial or capital markets, but rather to include what happens with the prices of the financial instruments in those same markets.

In many of the emerging economies where pension reforms have been and will undoubtedly continue to be embarked upon, we know that there is a very substantial difference between the active and passive rates in the financial markets. This research by Dr Schmidt-Hebbel opens up the possibility of estimating the effects of the pension reform in reducing this gap between active and passive rates or, to put it another way, the effects of the pension reform in reducing the cost of capital or the cost of financing in the economies. In this sense, reading the document produces a desire to move forward in the matter of the effect of the reform on prices or on the behaviour of interest rates and particularly the cost of financing.

On the other hand, this section seems particularly relevant, because it clearly shows and quantifies how the development of the capital market may benefit or increase economic growth in economies. However, there is a word of warning here because, as in Chile's case, we know that this development of the capital market will occur only to the extent that the authorities do not hinder the flexibility of the administrators' investment system. If this flexibility is limited or restricted in any way, or there is a very slow transition to the type of securities and percentages in which the resources arriving at the pension administrators can be invested, these capital market development coefficients, which are estimated for Chile's case, may be non-applicable in other economies, because they are too high.

Of course, the beneficial effects of the deepening of the capital market on economic growth make it advisable to advance as

quickly as possible in this transition towards a more flexible investment system.

In the case of employment, Dr Schmidt-Hebbel starts from the correct assumption that pay-as-you-go systems constitute an implicit tax on the demand for labour and for this reason he argues that the pension reforms decrease that implicit tax. This in turn generates more employment in the economy, discourages employment in the informal economy and improves work productivity.

Here, he explains, he bases himself on other authors, particularly quoting the case of Edwards and Edwards and Torche and Wagner, who indicate that employment has grown in Chile between 1.3% and 3.7% on average in the course of these 22 years. It would seem that these results may be a slight over-estimate, and in any case they calculate benefits that are somewhat higher in the area of employment, by assuming a totally elastic supply of work.

However, this opens an opportunity for a detailed analysis of the effects of the modern pension systems on the different segments of the labour market, because it is well-known that elasticity both in supply and demand in different sections or parts of the labour market is different, and in this sense the benefits of the pension reform may be different. Although Dr Schmidt-Hebbel's intention is to make an aggregate estimation, as he states clearly at the outset, here there is a possibility of continuing to make progress on the effects of pensions in the field of labour, which is a relatively less explored area.

In the case of productivity, Schmidt-Hebbel estimates a relation between the total productivity of production and financial deepening. His econometric evidence is irrefutable and shows that there is indeed a positive relation between the two. In other words, if the authorities make financial deepening easier, as was mentioned earlier, the productivity in factors of production will rise and that, in turn, means that the economy will make better progress.

The results or econometric estimates that he makes are undoubtedly valid; however, this is another area which produces a desire to have a more detailed knowledge of what might be called the transmission channels; i.e. how that increase in financial



deepening causes the factors of production to yield more. In other words, the quantification exists, it is valid and solid, but maybe there is room to expand on how that improved performance of factors of production actually occurs.

The Chilean reform is 22 years old and is a mature reform. However, there are other cases where the benefits of the reform are only just beginning to proliferate. It might be said that the reform in Chile is a mature woman, while the reform in Mexico is a mere youngster. Nonetheless, there are indications that the benefits of this reform may be highly significant and for this reason we shall be analysing various aspects which enable us to conclude that these benefits are indeed being felt in Mexico.

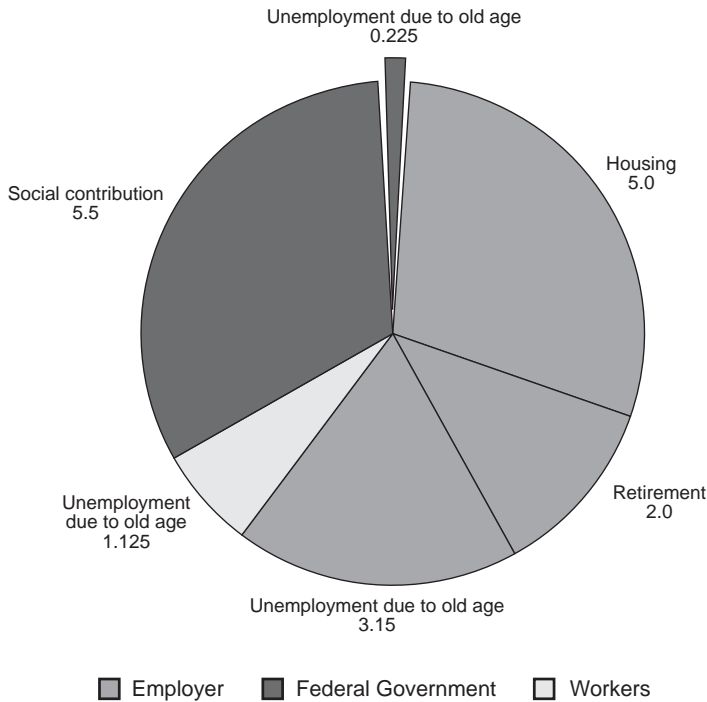
Table N° 1 describes the development or basic chronological path of the pension system. As from the year 1996, with the Law of Retirement Savings Systems, there was a system of individual accounts and individual capitalization.

**Table N° 1**  
**BASIC CHRONOLOGY OF THE PENSION**  
**REFORM IN MEXICO**

Pay-as-you-go system with defined benefits	(for over 50 years)
Individual savings accounts for retirement	(1992)
Change to system of defined contributions	(1995)
Law of Retirement Savings Systems	(1996)
Additional reforms	(2002)

In Figure N° 1 it is worth emphasizing that the contributions to the pension system in the case of Mexico are tripartite; in other words, the State, the workers and the employers all contribute. That is important when analysing the benefits for the contributors in the different measurements that can be taken in this respect.

**Figure N° 1**  
**TRIPARTITE COMPOSITION OF CONTRIBUTIONS**  
(CONTRIBUTION AS % OF WAGE)



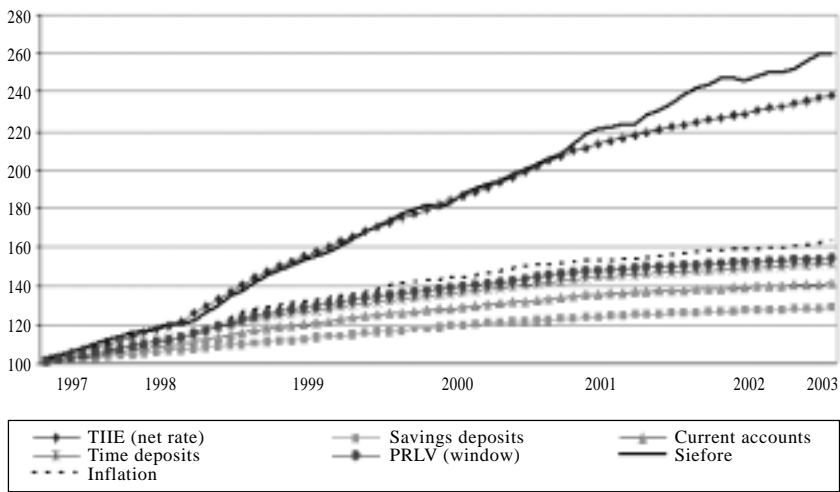
In Figure N° 2 it can be seen how in Mexico's case, after five years, the funds already represent approximately 5.2% of the GDP. If the housing aspect is removed, they represent almost 3% of the GDP. In other words, there is considerable growth taking place in the case of Mexico, and although it is still far from what may be seen in other countries such as Chile, it is moving in the same direction.

Figure N° 3 is very informative, because it explains from a series of yield indexes that the pension administrators have produced very substantial yields, well above the rate of inflation. This can be compared by saying that from the year 1997 to the present, the accumulated inflation is 40% while the yields accumulated by the administrators on behalf of the contributors are over 260%, in quite a short period of time.

**Figure N° 2**  
**FUNDS CONTRIBUTED BY THE WORKERS**  
**(% GDP)**



**Figure N° 3**  
**YIELD INDEX OF DIFFERENT INVESTMENT INSTRUMENTS**  
**1997-2002**  
**(SEPTEMBER 1997 = 100)**



When speaking benefits, it should be stressed that, depending on the category of occupation under discussion, the replacement rate seems a somewhat biased indicator, when it refers to the final wage received by the contributors. If average wages are taken into account, it will be seen that replacement rates rise considerably and may vary between about 60%, depending on the occupational category, up to 76%. And this happens in such a way that, given the characteristics of the system in Mexico, the workers with lower incomes benefit more than those with higher ones.

As was pointed out above, due to the fact that it is not only the workers who contribute towards their pensions in Mexico, but also employers and, in part, the State, when the internal rate of return is calculated for employees, a series of actuarial assumptions are made for the working life during which they will be paying contributions and it may be observed that returns oscillate around 30% in real terms. That would be a really exceptional rate, given the resources with which they are contributing.

There are some measures and some reforms which have brought about improvements in the Mexican pension system. You will realise that some have been directed towards encouraging saving, promoting competition between administrators, making investment more flexible, increasing information and transparency and reinforcing the institutional organization of the system.

In Mexico the reform is under way and, as has been mentioned, it is still only a youngster. However, from what can be seen in some of the indicators, it promises to provide very important benefits for our country.

# PENSION REFORM AND FISCAL DEFICIT

LUIS FERNANDO ALARCÓN<sup>1</sup>

## 1. INTRODUCTION

In 1981, Chile made a structural reform of its pension system, changing from a pay-as-you-go system to one of individual capitalization. That road has been taken by a growing number of countries, particularly in Latin America and Eastern Europe, which have found that a thorough reform, involving the adoption of a new paradigm for pensions, is the way to contain the growing pressures on public finances caused by the old models. In the same way, an attempt has been made by these same changes to correct the unsatisfactory distributive impact of the pay-as-you-go systems.

The results of these reforms on economic growth, savings, the capital market and public finances have given rise to interesting academic debates which, as more information has become available, have allowed a fuller understanding of the strengths and weaknesses of the pension systems and have served to improve planning when implementing new reforms.

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<sup>1</sup> President of the Association of Pension Fund Administrators of Colombia, Asofondos. He has a degree in Civil Engineering from the Universidad de Los Andes with postgraduate studies in Economics at the same university. Master of Science in Civil Engineering (Water Resource Systems) from the Massachusetts Institute of Technology, MIT. He took part in the Oxford University Advanced Management Programme.

Former Minister of Finance and former Executive Director of the Inter-American Development Bank.

He is currently a member of the Board of Directors of the Banco de Bogotá, the Colombian Stock Exchange, ISA, Internexa y Petrocolombia S.A. He is also a member of the Governing Body of the Universidad de Los Andes.

This paper is concerned with the fiscal impact of the pension reforms, based mainly on the experience in Colombia, and contains six sections, including this Introduction. The second sets out the definitions to be used, emphasizing the difference between the Pay-as-you-go Systems, as they were conceived analytically, and the Loss-making Pay-as-you-go Systems, which are those that will require fiscal transfers at some point in order to guarantee their viability. The third section analyses some of the distributive implications of the pay-as-you-go systems, because it is felt that fairness and distribution of income are central concerns in any fiscal policy. The fourth section deals with the ways in which the fiscal effect of the reforms has generally been quantified, pointing out which methodology is conceptually correct and emphasizing the fact that the impact of the type of reform that is being analysed is two-fold: on the one hand it makes an existing, but unrecognised, debt explicit and on the other, avoids it continuing to grow until it becomes unmanageable. The following section, the fifth, deals specifically with the subject on the implicit pension debt, pointing out that the way in which it has been treated conventionally constitutes an incentive for fiscal imbalance, and indicating that the legal framework of each country establishes restrictions in handling it, since in many cases there are constitutional and legal rules which prevent the parametric adjustments that are necessary within a pay-as-you-go system from being made at the right time and with sufficient force.

Finally, there is recognition of the fact that the International Monetary Fund has begun a broad discussion process, designed to modify the way of recording pension figures in macroeconomic statistics, in order to sketch in a few proposals on the matter.

## **2. SOME DEFINITIONS**

Pay-as-you-go pension schemes were established during the last century. In the past few decades, these systems have been reformed, especially in Latin America and Eastern Europe<sup>2</sup>, in order to transform them into systems based on individual capitalization. Although these are two well-known schemes

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<sup>2</sup> Fox and Palmer, 2001, make a complete summary of the present state of the reforms in different economies.

which have been widely analysed in academic literature, it is important for the purposes of this paper to define what is meant by each of them.

The Pay-as-you-go Systems (PAYGS) are those in which the pensions at any given moment are paid out of contributions being paid, during that period, by the active workers. Normally they are defined by the equation:

$$rsP = csT \quad (1)$$

where  $r$  is the replacement rate,  $s$  is the average wage of the active workers,  $P$  is the number of pensioners,  $c$  is the contribution rate to the system as a percentage of the wage and  $T$  is the number of contributing workers. The left side of (1) represents the payments and the right the income of the system. The above equation is very useful for analytical purposes and allows important conclusions regarding equilibrium to be drawn for a system defined in this way, depending on the growth rates of the variables involved.

Normally the design of a pay-as-you-go system is made on the basis of demographic and economic assumptions which determine the evolution in time of  $P$ ,  $s$  and  $T$ , and the contribution rate  $c$  is defined in terms of what is necessary in order to reach the desired replacement rate,  $r$ . This latter is a clear public policy decision. Nonetheless, experience has shown that the assumptions made when the scheme begins quickly lose their validity, and for this reason it is necessary to make adjustments to the system from time to time. A more precise version of (1) therefore takes into account the changes in parameters over time and is expressed in the following way:

$$\sum_t (r_t s_t P_t) / (1 + i)^t = R_0 + \sum_t (c_t s_t T_t) / (1 + i)^t \quad (2)$$

where  $R_0$  is the accumulated capital or reserves of the system at the beginning of the analysis period,  $i$  is the discount rate, and the indicator  $t$  denotes the moment in time. The system defined in (2) takes into account the fact that equality between payments and the amount collected may not necessarily be achieved in each period,

and makes it possible to gradually adjust  $r$  and  $c$ , as the economic and demographic environment changes, as has in fact occurred in most developed economies. In addition, the pattern of such “parametric” readjustments will determine which generations win or lose, and in what proportions, and has important implications in terms of inter-generational fairness.

Now in fact the real world of pensions works in a very different way, and that is why the right side of equation (2) very often includes extra terms  $F_t$ , which represent the fiscal contributions of the period. These contributions, coming out of general fiscal funds, are very common in developing countries, and have in fact been the rule in Latin America, and their origin must be obvious: demographic changes meaning that the population grows more slowly and lives longer, exaggerated pension benefits, low contributions and parametric readjustments that are delayed and insufficient. If we define, below,  $FPD$  as the fiscal pension deficit<sup>3</sup>, in other words, the projection of the total deficit arising from such imbalances, or the present value of the missing  $F_t$ , then,

$$DFP = \sum_t F_t / (1+i)^t = \sum_t (r_t s_t P_t) / (1+i)^t - \sum_t (c_t s_t T_t) / (1+i)^t - R_0 \quad (3)$$

The pension systems that show this type of imbalance will be called Loss-making Pay-as-you-go Systems (LPAYGS) in this paper, because they do not fulfil the conditions implied in equation (2).

As may be observed, the PAYGS are defined in aggregate terms and have important implications in terms of inter-generational redistribution, which usually come out heavily in favour of the first generations of pensioners<sup>4</sup>. The way in which these aggregates are distributed between the different groups of the population is variable, and may be more or less re-distributive, a subject which will be treated later.

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<sup>3</sup> This is one of the various alternatives for defining the Implicit Pension Debt, known in the literature as “Open-System Liability”. See Holzmann, Palacios and Zvinienė, 2002.

<sup>4</sup> As occurs normally in the so-called “Ponzi schemes” which are untenable in the long term. Paul Samuelson’s article in Newsweek, 1967, is frequently quoted, in which he states that: “the beauty of social insurance is that it is actuarially unsound... A growing nation is the greatest Ponzi game ever invented”. The conditions for making this “game” work are frequently forgotten.



As an alternative to the PAYGS, and in order to contain the growth of the increasing deficits associated with them in the terms defined in (3), in the past few decades various countries have brought in reforms by which Individual Capitalization Systems (ICS) have been introduced. In these, each worker saves a mandatory percentage of his wage throughout his/her working life. In this scheme, the accumulated capital is used to finance the pension when the time for retirement arrives. There are various mechanisms for paying the pension, some of the most important being the gradual, scheduled withdrawal of the funds, the purchase of a life annuity from an insurance company, or a combined option. In addition to this, these schemes are usually accompanied by some type of explicit state subsidy<sup>5</sup>, so that workers on lower incomes, who have not saved enough to finance a minimum pension, can receive one, provided that they fulfil certain conditions of loyalty to the system.

The PAYGS are also known as defined benefit systems, and the ICS as defined contribution systems. The ICS are frequently known as Private Pension Systems, because they are usually managed by institutions of that type, while the PAYGS are run by state or public bodies. That definition is not particularly relevant and it often appears in debates loaded with ideological rather than technical content. In fact, a capitalization system can be managed by the State and the most outstanding examples are the Provident Funds, as found in Malaysia. In the same way, it is possible in a PAYGS for some or all of the functions to be carried out by private companies through outsourcing contracts, which fit perfectly into activities such as information management, enrolment of workers, collection of contributions and fiduciary management of the funds.

In reality, it can be held that any mandatory pension system, which is created and regulated by the legislation of the country concerned, is public for that reason alone, by contrast with those which arise as a result of private initiative and where membership is voluntary on the part of those who belong to them. Whether the State decides to manage the system directly or delegates its

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<sup>5</sup> This subsidy is usually paid out of general fiscal funds and is assimilated to the first pillar of the proposal made in World Bank 1994. However, in the reform recently enacted in Colombia, mechanisms are established which make it endogenous to the ICS, with important distributive implications. For some, however, that is a distortion of a "pure" ICS. For a description of the scheme, see Asofondos, 2003.

management to third parties is a different matter, and the latter, as has already been pointed out, can happen in any system.

In theory, either of the two pension systems mentioned, or a combination of them, may be suitable for a particular society. The great challenge, of course, is to ensure that the design is appropriate and that it fulfils the desired objectives in terms of macroeconomic policy, fairness and impact on the labour market. And that is the nub of the matter<sup>6</sup>.

The PAYGS have the attraction that they conceptually allow greater risk diversification, both economically and demographically. However, experience has shown overwhelmingly that in most cases, especially in developing countries, their performance has been poor, both from the fiscal and distributive points of view. From the fiscal angle, because they have very rapidly ceased to be PAYGS and have become LPAYGS, with large amounts of *FPD* which become unmanageable once fiscal transfers become necessary in order to meet pension payments. This has been the main reason for introducing the ICS, because the political processes in developing countries usually mean that the adjustments in parameters  $r$  and  $c$  in equation (2) are delayed and insufficient, with the result that the solutions, as a general rule, are scarcely even partial. By contrast, the ICS are by definition balanced from the financial point of view, unless there is some type of subsidy like the minimum pension guarantee mentioned above, in which case these are “deserved”, focalised subsidies, directed at specific groups in the population. As far as the distributive aspects are concerned, that is the subject of the next section.

### **3. WHO WINS AND WHO LOSES IN THE PAY-AS-YOU-GO SYSTEMS**

As was pointed out in the previous section, the normal thing in the PAYGS is to see large aggregates which determine their financial viability, and from that point of view, what really matters are the average rates, both of contribution and replacement. As regards the

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<sup>6</sup> Most of the academic debates have remained in the area of “ideal systems”. A good example of this is Orszag and Stiglitz, 2001, which, due to the prestige of the co-author, has become the “Decalogue of arguments” of the political enemies of the ICS.

concrete design of how individual contributions are related to the benefits to be obtained, the most frequent is to define a basic income for deciding the pension payment (BI), which is usually the average wage of the last few years, and a replacement percentage depending on the number of years during which contributions have been paid, with both minimum and maximum percentage limits. In Colombia, for example, before the 1993 reform, the BI was the average wage accrued during the last two years; after that, the period used was increased to ten years. In the same way, prior to 1993 the replacement rate varied between 45% with ten years' contributions and 90% after twenty years, and was adjusted at 65% with a thousand weeks and 85% after one thousand four hundred weeks of contributions<sup>7</sup>.

A definition of benefits such as that summarized in the previous paragraph for Colombia, would appear to be neutral from the point of view of income distribution, because general conditions are defined there which apply in principle to all workers, regardless of their income. However, because there is no clear, explicit definition of the relationship between contributions and benefits, such mechanisms usually work in favour of members with higher incomes, with a totally different result from the one that is normally sought. Some, though not all, of the reasons why this happens are presented below.

In the first place, life expectancy has a high correlation with income level, even in more advanced countries, as was stated by the bi-partisan commission studying reforms to the social security system in the United States in its interim report in August 2001, in the following terms: "First, lower-income individuals tend to have shorter life expectancies. As a result, low-income workers spend a greater portion of their lives contributing to Social Security and a smaller portion collecting from it".

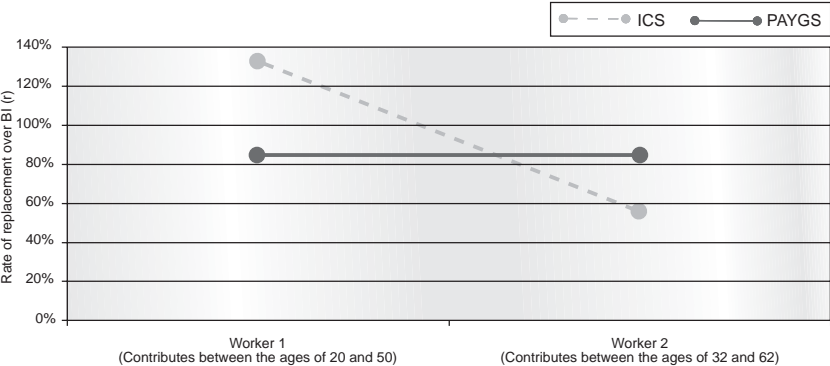
A second aspect, which has received less analytical attention in literature, has to do with the age of entering the work force which tends to be significantly earlier in the case of poorer people, with less education. To illustrate this point, an example has been constructed, as shown in Figure N° 1. Two hypothetical workers

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<sup>7</sup> These conditions were modified in the law enacted at the beginning of this year, making them stricter.

have been considered, who contribute to the system for 31 years, with the difference that the first contributes between the ages of 20 and 50 and the second between the ages of 32 and 62. A calculation is given for the replacement rate that both workers would obtain under the PAYGS and the ICS, as they existed in Colombia until this year's reform. It is assumed that the real yield for the ICS is 6%, and that in both cases the wage grows 1% per year in real terms.

**Figure N° 1**  
**EFFECT OF CONTRIBUTING AT THE BEGINNING OR AT**  
**THE END (31 YEARS WITH 100% CONTRIBUTIONS)**



As might be expected, the ICS rewards people who join the system early. For this reason, worker 1 achieves a replacement rate of around 140%, whereas worker 2 gets only 57%. The paradox is that on the other hand, in the PAYGS, the two would have the same replacement rate on the BI, 85%, giving a totally incorrect signal. It is worth pointing out that in poor countries with great inequalities the unskilled labour force typically starts work at between 16 and 18 years of age, the middle class at about 23 years of age, after graduating from university, and the more wealthy at about 30, after obtaining an MBA and some practical work experience abroad.

The third and last reason has to do with the way in which wages evolve over the course of a working life. In the case of unskilled labour, wage curves are seen to be very flat, with only a very

slight increase, if any, over time. What is more, in these cases, the years corresponding to the end of a worker's working life are often not those in which the wage is highest. For this reason it clearly makes no difference to these individuals, in the light of their interests, whether the BI is calculated on the basis of their final wages, or on the average of the wages accrued during their working life. By contrast, for those with high incomes, it is typical to find steeply ascending wage curves, due to reasons proper to the labour market or, in many cases, to individual decisions which reflect highly reprehensible conduct on the part of those in a position to manipulate their income in search of a better pension.

This last case is quite frequent in countries like Colombia, with low State control capacity and lax social discipline. In the case of independent workers with high incomes, for example doctors and other professionals, or employees of family businesses, workers frequently contribute to the system on the basis of very low incomes, which they increase rapidly when they are approaching the years that will be taken into account for calculating the pension. In order to illustrate this point, and using once again the conditions in Colombia, we have assumed an individual who joins the system at 20 years of age and contributes on the basis of a minimum wage until he/she is 10 years off retiring age. As from that moment he/she increases his/her contribution base to 20 minimum wages<sup>8</sup>. This person, in the PAYGS in Colombia, would receive a pension of 17.2 minimum wages, while his/her contributions in the ICS would allow him/her to finance a pension of 2.7 minimum wages. In other words, the manipulation of the calculation mechanism allows him/her to obtain a pension 6.3 times higher than that achievable by his/her own contributions.

What I have just described may sound exotic and inconceivable for analysts in developed countries. However, this is the real world of pensions in this part of the world. In the pension reform recently enacted in Colombia, which makes drastic adjustments to the PAYGS which exists in the country alongside the ICS, the Government proposed that the BI should be calculated on the basis of the worker's complete working history and not that of the last

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<sup>8</sup> In Colombia workers must contribute on basis of the minimum wage established by the government, at least. The maximum contribution wage was 20 minimum wages until this year's reform, when it increased to 25.

ten years. The Government was prepared to accept an increase to fifteen years at least, but it was still defeated. This is not surprising in view of the interests involved, which do not correspond precisely to those receiving a minimum wage. As might be expected, the defence of the status quo was made on the basis of “progressive rhetoric” and against “neo-liberalism”.

In the ICS problems such as those mentioned above do not arise, because the design guarantees that the microeconomic signals are always correct: in order to maximize the pension, it is necessary to join the system early, avoid evasion and contribute on the basis of real income. Here there is no room for “free riding” and encouragement is given for saving and other individual patterns of conduct which are normally considered valuable in any society.

For the above reason, to conclude this section, it should be mentioned that if one wishes to correct the microeconomic distortions of the PAYGS, which lead to a redistribution in reverse of income, it is necessary to incorporate the conceptual mechanisms of a ICS, as was done in Sweden through the reform enacted by Parliament in 1994, and which began to operate fully at the beginning of this year. There they have produced an interesting combination of schemes, by which the pension aggregates are managed like a PAYGS, according to equation (2), but the calculation of benefits for each member is made on the basis of the whole working life, capitalized at a rate of interest that guarantees the macroeconomic stability of the system<sup>9</sup>.

#### **4. THE FISCAL IMPACT OF THE REFORMS: HOW TO QUANTIFY IT**

The reasons for introducing the pension reforms in the last few decades in almost the whole of Latin America and in certain countries in Eastern Europe have to do with the subjects explained in the previous sections. On the one hand, governments have discovered, from one day to the next, that the *FPD* levels of their pension systems are really exorbitant and that, on the other hand, they will need large transfers of fiscal funding in the near future,

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<sup>9</sup> The contributions of each member are capitalized in a “notional defined contribution account”, whose return does not depend on the market, but on economic growth and demographic variables, as in a PAYGS.

$F_t$ , to make up the cash shortfalls of the institutions responsible for paying pensions. In addition, those governments have realized that the big beneficiaries of those transfers are not the most vulnerable groups in the population, and for that reason they have sought solutions to guarantee that such a situation will not occur again in the future.

Conceptually, one alternative would be to carry out a reform of the parameters of the PAYGS, attempting to find conditions of long-term actuarial balance and accepting the costs of that part of the *FPD* on which it is impossible to take action<sup>10</sup>. However, the reality of decision-making in our countries shows unequivocally that this approach would produce great frustrations, since the most likely outcome is that the political transaction would lead to very partial reforms, with relief for public finances in the immediate future and a reappearance of the same problems a little later on. For this reason, the countries that have introduced reforms involving a change from a LPAYGS to an ICS have adopted a new paradigm (Holzmann, 2001) which, by definition, leads in the long term to financial balance and to the correction of microeconomic and distributive distortions. In those cases, a structural, definitive solution is being sought, rather than a palliative measure.

Now, the difficult part of implementing these reforms stems from combining an already existing situation with the introduction of a new one. In this respect the reforms have had the following elements: first of all, the norm is to allow those people who have already obtained a pension to continue enjoying it on the original terms<sup>11</sup> and those who were members of the PAYGS at the time of the reform to choose whether to transfer to the new ICS, giving them a recognition bond to compensate for the pension rights accrued to that point, or to remain in the PAYGS, but with reduced benefit expectations. New workers, in some cases, such as Chile and Mexico, are obliged to join the new ICS and in others, like Colombia and Peru, they are given freedom to choose which of the two schemes they wish to belong to. As a general rule, there are increases in contributions in any case. Finally, it is common for some kind of State Guaranteed Minimum Pension to be established

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<sup>10</sup> This would be the recommendation implied in the “ideal world” of Orszag and Stiglitz, 2001.

<sup>11</sup> In Colombia, for example, respect of acquired rights is a constitutional mandate.

for workers on low incomes who belong to the ICS. These are the elements that must be borne in mind in order to evaluate the fiscal impact of the pension reforms.

On this point it is important to introduce the concept of Implicit Pension Debt (IPD), essential in a PAYGS. The IPD is the actuarial liability that exists at each moment in time. In order to calculate it, there are at least three definitions (James and Brooke, 2001, Holzmann, Palacios and Zvinienė, 2002), which are summarized below.

- i) Debts incurred so far. Present value of the future pensions to be paid, on the basis of rights already acquired by pensioners and workers who are currently members of the system. Future contributions and their corresponding rights are not included. It is also known as “the termination hypothesis” and is equivalent to the liabilities that would appear in the accounting statements of a private company if those debts were its responsibility and is also equivalent, conceptually, to the value of the recognition bonds in the event of all members wishing to transfer to the ICS.
- ii) Closed system method. Like the previous one, it is restricted to current members, but includes the future flows, not yet accrued, of both contributions and benefits for that group of the population.
- iii) Open system method. In addition to the two previous concepts, this includes the present value of the cash flows attributable to new members, theoretically in perpetuity and for practical purposes during a sufficiently long horizon, defined arbitrarily. It corresponds to the definition of FPD in equation (3).

Concepts ii) and iii) include “debts” that have not been incurred and therefore, in the strict sense, do not exist. For that reason, when this paper refers to the IPD, it will be referring to definition i), and therefore, definition iii) has been called FPD, which is a projection of the potential impact of the pension system on public finance in a particular scenario<sup>12</sup>.

Within the logic of the PAYGS, the IPD at each moment is a debt in favour of current generations of pensioners and active workers, which will be settled by contracting new debt with future

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<sup>12</sup> It should be understood, however, that all the cash flows that affect the Central Government are included in the calculation of the FDP: the minimum pension guarantees, for example, if relevant.



generations. When the PAYGS works as it should, in other words  $F_t = 0$  for all the periods  $t$ , this “roll-over” takes place without difficulty and the debt is never paid but is refinanced with more debt, without the need for fiscal transfers.

When a reform is made in a system which fulfils the above conditions, implying a change from a PAYGS to a ICS, the fiscal impact consists in converting the IPD into explicit debt<sup>13</sup>. In that case, the decision to reform would be based on arguments such as the need to correct the distributive and microeconomic distortions described in the previous section, the desire to encourage the participation of the private sector in the management of pension savings, promote the development of the capital market or other political reasons, but not to make fiscal corrections, because the resources of the pension system would be sufficient, and as has already been said, no additional transfers out of the General Budget would be necessary. Of course, in that scenario, the Government would also have an explicit source of funding to finance its increased debt, which would consist of the pension savings channelled through the administrators of the ICS. Those resources, of course, would have to be raised by market mechanisms<sup>14</sup>, unless the laws established some mandatory procedure for investment in Government debt.

These assumptions are used in many studies on the subject, whereas in fact it would not be valid to assume that no fiscal contributions would be required without a reform. In other words, it is assumed that the original system is a true PAYGS, whereas in practice it may well be a LPAYGS. This approach involves an overestimate of the so-called fiscal impact, and may be seen, for example, in the work done by Uthoff for CEPAL on the case of Chile (Uthoff, 2001). The problem in these cases is that all fiscal payments are counted within the fiscal impact attributable to the reform, which is equivalent to the FPD as defined in (3), without subtracting those that would have had to be paid anyway, even

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<sup>13</sup> It is not correct to talk of a “fiscal deficit” caused by this operation. It is in fact a substitution of debt, which affects the government’s capital account (Cifuentes and Valdés-Prieto, 1997).

<sup>14</sup> Paying market interest. The cost of the implicit debt in the case of a PAYGS tends to be lower (Valdés-Prieto, 1997), but if it is a LPAYGS, the cost may be much higher, depending on how unbalanced the system is and how great the fiscal transfers required.

without the reform. In the aforementioned paper there are things as obvious as the payment of pensions to the armed forces, which would undoubtedly have had to be paid out of general fiscal funds in any case, and which is therefore not an increased public expense attributable to the change of pension scheme.

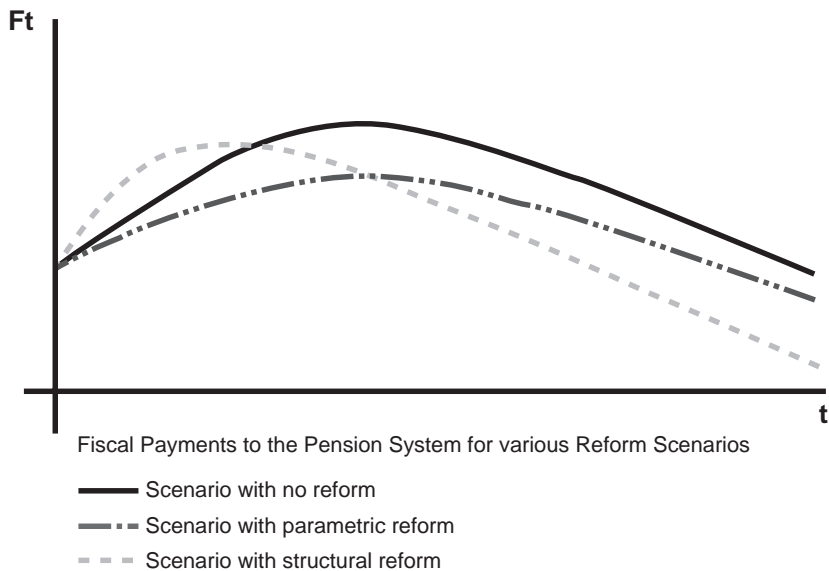
The correct approach undoubtedly requires much more thorough work, including the following elements:

- i) To produce a projection model that is as detailed as possible.
- ii) To define more exactly and more realistically what the alternative scenarios would be if the reform to a ICS were not carried out. At least two should be specified: the basic case, to do nothing and continue with the status quo, and the partial reform case, in other words, what could reasonably be obtained, given the real political situation of the country, in terms of parametric reforms, as an alternative to a full, structural reform.
- iii) To construct, in each case, the resulting flow of fiscal transfers over a long time-horizon. To calculate the implicit pension debt of the government at the end of that period, in order to make the terminal corrections to allow an adequate comparison, and calculate the resulting FPD for each scenario.
- iv) On the basis of the above, calculate the incremental flows which, when translated into present value, allow the fiscal impact of the reform to be estimated at present value.
- v) Carry out a careful analysis of the sensitivity of the most important assumptions.

Figure N° 2 illustrates what the cash flows of fiscal payments would look like for the suggested scenarios. In the first place the unreformed scenario and following that, the scenario with partial reforms or mere parametric adjustments, which in principle would imply lower fiscal payments than the above. This is due in the first years to the higher contributions that are normally decreed and in the following years, to the combined effect of higher contributions and lower pension payments. Finally it shows what the fiscal impact of the structural reform scenario would look like. It may be observed that in the first years the fiscal payments will be higher than in the other two scenarios, due to the fact that it will be necessary to continue paying the sum of the existing pensions, without receiving the contributions of the workers who have transferred to the new ICS. Another factor in that behaviour is the fact that the recognition bonds have to be paid in their totality at the time when the member becomes eligible for a pension. In this

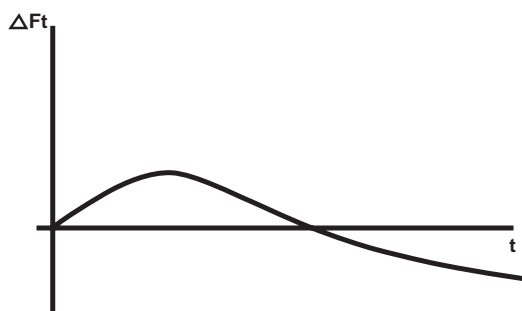
latter scenario, and also with time, the fiscal payments will tend towards zero and their amount will be limited to the minimum pension guarantee, if such exists.

**Figure N° 2**  
**FISCAL PAYMENTS TO THE PENSION SYSTEM**  
**FOR VARIOUS REFORM SCENARIOS**



According to the above diagram, the evaluation of the change from the present situation to a typical parametric reform presents no difficulties, because it should normally produce decreases in fiscal payments in all the periods under consideration. As a result the fiscal impact will always be positive. The situation is different when the comparison includes the structural reform case. Figure N° 3 shows the increased/incremental flow, in other words, the difference between this scenario and either of the other two in Figure N° 2, for example, the one that considers the parametric reform. As may be observed, during the first years the difference is positive, meaning that fiscal payments will be greater, for the reasons already explained, but there will be compensation for this at a later stage.

**Figure N° 3**  
**INCREMENTAL FISCAL PAYMENTS**  
**STRUCTURAL REFORM - PARAMETRIC REFORM**



As a general rule, a reform which involves passing from a LPAYGS to an ICS brings the schedule of fiscal transfers to social security forward in time. For that reason, given that the idea is to make inter-period comparisons, the discount rate becomes the determining factor. Even so, the fact that an ICS is financially balanced by definition, which is not necessarily the case with the alternative against which it is being compared, means that the fiscal impact of this type of reform may be positive.

An approach such as that referred to above was used to quantify the fiscal impact of the Colombian pension reform of 1993 shortly after it was enacted (Schmidt-Hebbel, 1995). Today, looked at from a distance, it is possible to evaluate that exercise objectively and extract some interesting lessons.

In the first place, the aforementioned paper clearly showed the explosive nature of the base scenario, in other words, that of doing nothing. The second aspect to be underlined is that the main comparisons were made using some very ambitious assumptions for economic growth, real growth of wages and increase in the coverage of the system, which meant that the fiscal costs of having made a simple parametric reform were postponed in time, producing an underestimation of their real impact. Even so, it was estimated that, of the 83.6% of the GDP, at present value, which would be the fiscal payments requiring explicit funding, 24.4% would be attributable to the deficit caused by having made a partial reform, i.e., without introducing the ICS.

The 1993 reform, in addition to introducing the ICS in Colombia and making a steep readjustment of contributions<sup>15</sup>, retained the pension conditions of the previous schemes as a “transition period” for 20 years. This had particularly catastrophic fiscal implications in the case of employees in the public sector, for whom this special clause meant the possibility of retiring at 55 years of age, with 20 years of service, with a replacement rate of 90% of BI<sup>16</sup>.

The paper by Schmidt-Hebbel, referred to above, forecast an operational deficit of 1.68 of the GDP for 2002 in the scenario of the reform as enacted, which was explained by a deficit of 0.57% in the Social Security Institute (ISS)<sup>17</sup> and 1.11% in the public sector. The reality for that year was a deficit charged to the national budget of approximately 3.5% of the GDP, originating entirely in the public sector.

This, added to the fact that it had been estimated that the ISS reserves would be used up as from 2005 and there would be substantial operational shortfalls, decided the Government to push through a new pension reform, and the Congress to approve it. This came into operation at the beginning of this year, and in addition to new readjustments of contributions and the parametric adjustments needed in the general pay-as-you-go scheme, it eliminated, as from the new year, many of the privileges of the so-called transition scheme established in 1993, which, as has already been stated, retained the status quo in pension benefits for 20 years. It also established a mechanism to finance the Minimum Pension Guarantee with the contributions from the ICS itself. According to the estimates of the National Planning Department, this reform reduced the present value of the liability chargeable to the national government, i.e. the FPD, from 206.5% to 154.8% of the GDP, in other words, it reduced it by 51.7% of the GDP<sup>18</sup>. The above figure is practically identical to the total debt, domestic and

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<sup>15</sup> The contribution increased from 8% to 13.5%.

<sup>16</sup> As was explained earlier, this is the average of the wages from the last ten years, corrected for inflation.

<sup>17</sup> This is the state company in charge of managing the pay-as-you-go system, with the exception of some public sector schemes with special treatment.

<sup>18</sup> In the past few years the government has made a great effort in building databases and modelling the pension system. For this reason, these figures look much better than those originally quantified in Schmidt-Hebbel 1995. For a description of the Colombian system immediately before this last reform, see Acosta and Ayala, 2001.

foreign, of the Colombian public sector, which highlights the importance and magnitude of the reform.

It is worth reflecting at this point on the importance of the fiscal transparency concerning pensions which accompanies the ICS. Although the ISS has required no transfers from the national government during the ten years since the 1993 reform, it is on the point of beginning to do so, as already mentioned, and is expected to, as from about 2005. If the 1993 reform had been introduced in the way it was, with the single exception of not having introduced the ICS to Colombia, the ISS, instead of having its reserves on the threshold of exhaustion, would have in its hand the savings which have been paid into the ICS and are being managed by the AFPs<sup>19</sup>, and would be generating considerable operational surpluses which would have masked the problem completely. It is reasonable to assume that in that case, the possibility of making a new reform in Colombia would never even have been contemplated, this year's law would not have been passed, the beneficiaries of the transition scheme would have continued to have access to the privileged benefits granted by the scheme already described, the parametric readjustments that were carried out would not have been made and even more FPD would have been accumulated to be borne by subsequent generations. In other words, what is suggested by the recent example of Colombia is that there may be a second round of positive fiscal impacts, arising from the fact of gradually making the IPD more explicit. This fact leads on to the discussion in the next section.

## **5. HOW TO SHOW IMPLICIT PENSION DEBT**

The subject of whether the IPD should be considered as such, and should therefore appear in some form in the public accounts, has been the object of interesting academic discussions<sup>20</sup>. The starting point of the discussion is that in a PAYGS the mechanism for re-

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<sup>19</sup> Savings which currently amount to approximately 8% of the GDP.

<sup>20</sup> In Barr, 2000, and Hemming, 1998, there is a good summary of the arguments in favour of not registering those liabilities in the public accounts. Holzmann et al., 2002, present the opposite view. It is interesting to note that those who work in the IMF and in the World Bank seem to have opposing views on the subject, possibly due to the fact that in the first of the two multilateral institutions, the emphasis is on the short term, while in the second, priority is given to structural aspects.

financing the debt is automatic. It is therefore irrelevant to reveal it. What is more, to do so may be counter-productive and may give incorrect signals to the financial markets, for example.

The problem of course is considerably more complex when one moves into the territory of the LPAYGS. Although it is recognized that this possibility exists and that it is most common, it is normally argued that governments can increase contributions if that is the situation, (increasing the assets of the system) or cut back benefits (reducing the liabilities), or simply increase taxation or the level of debt to cover the deficits that have been produced. It is also argued that pension debts are different from conventional public debt in that their contractual nature is different. This is because pension rights are not negotiable and the government can modify them unilaterally and, finally, because it is quite difficult to calculate them precisely.

For this reason the practice is quite simple. The collection for the period is recorded as current income and the payments made during the same period, as expenditure, exactly as described in the methodologies of the International Monetary Fund (IMF). Since these are so important, it is worth quoting them verbatim<sup>21</sup>.

“Since the government may modify social security benefits at will as part of its economic policy, there is a degree of uncertainty regarding the likelihood of payment or the amount of the payments corresponding to retirement benefits. As a result, there are no liabilities connected with the social security systems in the EFP system and an expense is recorded only when the benefits have to be paid. However, due to the fact that it is highly likely that retirement benefits will be paid, an item should be estimated for information purposes, equal to the present value of the benefits accrued to date, as indicated in paragraph 7,145 of chapter 7”. (Appendix to Chapter 2, Social Protection)

“Some analysts maintain that, in a comprehensive inter-period framework, it might be more appropriate to consider social security contributions as an accumulation of assets, associated with future liabilities. Similarly, many social security benefits might be considered as the extinction of liabilities previously

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<sup>21</sup> Manual of Public Finance Statistics, 2001

incurred by the government. That approach is not adopted in this manual because it is considered that the social security systems do not give rise to contractual liabilities for the government; in other words, there is no direct link between the contributions made and the benefits which are finally paid. What is more, it is not unusual for governments to modify the structure of benefits unilaterally (for example, by changing the circumstances under which the benefits are paid or the amount of the payment). (Chapter 4, Analytic Framework.)

In the light of the above, it is legitimate to make a few observations, using the case of Colombia once again as a reference, which is probably very similar to that of many developing countries, especially in Latin America.

To start off, it is important to pinpoint the contractual nature of pension debts and the rights of citizens. In Colombia, the power to modify the pension scheme, and in consequence to modify contributions or benefits, does not belong to the Government, but to Congress. Any change to the existing scheme therefore comes within the corresponding process of political transaction, with the result that solutions tend to be a compromise and fall short of what is really needed. This is illustrated by what happened in the 1993 reform, which maintained exaggerated privileges associated with the so-called transition scheme for 20 years. The other aspect to be underlined is that, according to the Colombian legal framework, once the requirements for access to a pension have been met, a right is acquired which cannot be modified from then on. Not even the law can alter those acquired rights<sup>22</sup>. Finally, those pensions, which are unchangeable, have very precise mechanisms to protect them and, for example, are index-linked for inflation, meaning that they are readjusted annually by a percentage equal to the increase in the Consumer Price Index. This means that although the Government could, in a situation of strong macroeconomic imbalances, liquidate domestic public debt issued at fixed interest rates by means of inflation, it could not resort to the same expedient to get rid of pension obligations that had already been contracted. In other words, the Colombian legal framework implies that corrections must be made at the right time, because as time goes by there will be an increasing number of beneficiaries of

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<sup>22</sup> There is ample jurisprudence from the Constitutional Court on the subject.



the system who “acquire rights” which are impossible to alter at a later stage.

But, if the legal rigidity already mentioned makes it imperative to adopt the measures related with the readjustment of pension benefits with the minimum of delay, because they would be less effective later, the signals being sent by current legislation with regard to Fiscal Accounting<sup>23</sup> point in the opposite direction. In fact, it should be noted that the rules described imply that, in order for a reform to produce short-term fiscal effects, it is necessary to increase contributions or the number of contributors, while more structural adjustments, which also have distributive implications in systems like the Colombian one, will only show their effects later on, due to the fact the reduction in benefits in a PAYGS will only show effects on cash flow after several years. In view of the above, it is not surprising that a very substantial increase in contributions to the pension system was enacted almost immediately in 1993, while the readjustment of benefits was insufficient and its application was postponed for 20 years.

In the same way, it is worth making a few remarks on the initiatives that were about to be enacted by Congress during the previous Government (1998-2002), which, in addition to an increase in contributions, consisted of repressive mechanisms to increase the number of members in the LPAYGS<sup>24</sup>, such as decreasing the value of the recognition bonds, with no justification at all, in order to induce those who had changed scheme to return to the pay-as-you-go scheme, or oblige certain segments of the work force to join that scheme without the option. In those proposals, the generous transition scheme passed in 1993 was not modified, and the slight parametric readjustments proposed were to be made over 20 years.

But there are some additional considerations about the political economy of pension reforms and fiscal accounts. While the resources of the ICS constitute real savings, which are converted into the macroeconomic counterpart of the debt which is made explicit as a result of the transition, and there is therefore no effect of “crowding out” private investment, (Corsetti and Schmidt-

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<sup>23</sup> On this subject, the relevant authority is undoubtedly the IMF, especially in our countries.

<sup>24</sup> It should be remembered that the pay-as-you-go and individual capitalization systems exist side-by-side in Colombia, and compete against one another.

Hebbel, 1997), the same is not necessarily true when such contributions enter the coffers of the public sector. As has already been mentioned, the increase in contributions made in the 1993 reform meant that the social security sector generated important “surpluses” during the years immediately afterwards, reaching 2.3% of the GDP in 1996. These cash surpluses were invested in government securities, which is no problem in itself, but they served as a basis to increase the current expenditure of the central government, which rose from 9.8% of GDP in 1992 to 15.1% of GDP in 1997. From the accounting point of view, the increased deficit of the central government was mitigated by the surplus in the rest of the public sector, including social security. The paradox is that in a LPAYGS, with an actuarial imbalance between collections and benefits, that rise in income would be accompanied by an even greater rise in the IPD, with the result that, strictly speaking, what is being produced is a deficit, rather than a surplus.

In summary, the IPD is much more real than some academics and the IMF itself suppose, because once the right to a pension has been acquired, it is unchangeable, at least in Colombia. The only recourse open for balancing the finances of the LPAYGS is to reduce the benefits of those who do not yet have acquired rights and to increase their contributions, in a way which may become extremely unfair to future generations if the readjustments are not made at the right time. What is more, the fact of not making the debt explicit is a very clear signal, encouraging governments and congresses to adopt measures in favour of increasing their short-term pension income and, as a counterpart, increasing their expenditure on other activities in the public sector. As a result there is a reduction in savings, compared with the scenario in which the debt is made explicit, as happens when changing to an ICS.

For all the above reasons, the comments made by Holzmann et al., 2002, at the bottom of page 31, seem very relevant, where they state that “the current accounting systems can be said to unjustly penalize reformer countries when multilateral institutions such as the IMF focus on current deficit and conventional debt targets”.

## **6. BY WAY OF CONCLUSION**

The pension reforms make the unrecorded debt that has been produced by the LPAYGS explicit. Assuming that this debt does

not exist, even though, as was argued in the previous section, it is much more real than is normally supposed, creates considerable incentives for fiscal indiscipline. For this reason, there should be a warm reception for the recent initiative from the IMF to create a space for electronic discussion (Electronic Discussion Group - EDG) in order to evaluate the correct way of recording pension systems in macroeconomic accounts. A paper was prepared (Pitzer, 2002) as a starting-point for the discussion and it seems relevant to transcribe some of the ideas from it verbatim:

“Funded and unfunded schemes are similar in that both arise from contractual agreements between employers and employees, and both the nature of the benefits provided by the schemes and the eligibility criteria to obtain the benefits are the same...”

“In recent years, a substantial body of accounting research has developed support for the principle that pension liabilities for all types of schemes should be treated alike to the extent possible...”

“The majority of unfunded pension schemes are probably organized by governments. The development of accrual accounting standards by IFAC suggests the principles of accrual accounting should be applied to all government activities, that there will be a continuing trend of Governments converting to accrual standards, and the source data for economic statistics will reflect the recognition of all pension liabilities, regardless of funding sources”.

It is to be hoped that the above initiative will conclude by establishing a body of law which, for countries with LPAYGS, stipulates principles much closer to the economic reality of their pension systems and which also gives correct signals to achieve appropriate macroeconomic management.

Such principles should take the following elements into account, at least: in the first place, based on the healthy criterion which is becoming increasingly accepted even inside the IMF, that fiscal accounting must be based on accrual principles, to take the decision to record the IPD as a special item in the liabilities for which the nation is responsible, as from a given financial year. As soon as possible, standardized methodologies for its calculation must be established and the World Bank has made considerable progress in this respect. As regards the conventional debt, it would also be very important to list the criteria for

discerning which part of its increase originates from the conversion of IPD to explicit debt.

In order to guarantee the consistency of the debt figures with those of the result for each financial year, it would be necessary to carry the increase in the IPD to the social security area as an expense, which would of course increase the deficit calculated for the period.

In order to ensure that a methodological change of such magnitude in fiscal accounting does not have adverse effects on the relationship of the emerging economies with the financial markets, the multilateral institutions would need to accompany the governments of the developing countries in the important task of education, to make it possible to soothe the outbreaks of “fiscal illusion” which may occur (Schmidt-Hebbel, 1995). In other words, the markets have to assimilate the increase in explicit debt and the exposure of the IPD resulting from the pension reforms and the change in accounting practices as something positive, associated with a greater fiscal transparency which is in everybody’s interest, and not as a worrying symptom concerning the health of those economies.

Finally, it is necessary to understand that the object of this change is to enable the citizens of each country to grasp the fact that the pensions issue is extremely important, that its weight will rest on their shoulders and on those of their children and grandchildren for many years, that the debts on excess pensions have to be paid at the end of the day and that it is preferable to pay them conscientiously and in due order, rather than as the result of situations that have run out of control.

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# COMMENTS

RICHARD HEMMING<sup>1</sup>

It is well known that deficits emerge under PAYG social security pension schemes when it cannot be presumed that anticipated future increases in pension expenditure will be matched by higher contributions. A commitment to raise contribution rates, lower pensions, and/or increase retirement age can reduce and possibly eliminate these deficits. Another option is to increase budget transfers to cover social security deficits, but this simply increases the budget deficit, which may give rise to a need for tax increases or expenditure cuts at some time in the future. In effect, budget transfers turn a social security problem into a fiscal problem, but, the consequences for the consolidated government (including the social security system) are the same.

It is also well known that accumulated deficits get reflected in debt, and that an accumulation of debt increasingly constrains the capacity to keep on running deficits. This is familiar territory as far as government budgets are concerned, where the policy focus is usually on the implications of continuing current policies for future debt sustainability. Yet social security can be looked at in the same way, as can the finances of the consolidated government, and this interesting paper describes how one might do so. In this connection,

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<sup>1</sup> Deputy Director of the Fiscal Affairs Department (FAD) of the International Monetary Fund (IMF).

B.A., M.Sc. and Ph.D. from the Universities of Sussex and Stirling.

Dr Hemming has performed various functions as a member of the Asia-Pacific Department the IMF, serving as senior resident representative of that institution in India for two years.

At present he has direct responsibility in subjects relating to fiscal sustainability and vulnerability, financial crises and fiscal responsibility schemes covering such aspects as transparency and regulations.

the relevant operational concept is implicit pension debt, and the paper uses this concept to analyze the fiscal impact of a pension reform involving a shift from PAYG to funding. The discussion is illustrated by reference to the experience in Colombia.

Such a pension reform involves transition costs. In flow terms, this is because contribution income falls while pensions already accrued must to be paid. In stock terms, the government has implicit debt in respect of accrued pensions which has to be recognized as part of the pension reform (usually by issuing recognition bonds). However, this is not the same as the implicit pension debt that would give rise to a need for reform. In judging whether social security is unsustainable and therefore whether reform is needed, it is necessary to take into account not only accrued pensions, but also future pensions and contributions under current scheme rules. The net future liability is often much larger than the accrued liability, and the former is thus the principal determinant of whether there is a social security problem. The main contribution of this paper is that it highlights the importance of a comprehensive measure of implicit pension debt, that is the sum of the accrued liability and the net future liability, and calls for it to be regularly reported.

I have no disagreement on these points, and in this respect the paper is useful as it stands. That said, I have some suggestions as to how to strengthen the paper.

The paper could usefully recognize that the analysis of social security finances in many countries involves projecting pension expenditure and contributions forward to compute long-term deficits, and the case for reform is then made on the grounds that there are either economic and/or political obstacles to increasing contributions by enough to eliminate these deficits. The measure of implicit pension debt highlighted in the paper simply reflects the discounted value of these deficits, and reform is called for if contributions cannot be increased by sufficient to eliminate this debt. These are simply two different ways of looking at the same thing.

The paper could then make the case for focusing on implicit pension debt by pointing to the advantages of thinking about long-term social security finances and reform issues in a broad fiscal sustainability context, taking into account all on-budget and off-budget activities. Since it is now routine to think about the long-

term implications of the budget by reference to their implications for debt, not only should social security be looked at in the same way, but the budget and social security should be looked at together. However, this does not mean that regular debt and implicit pension debt should be added to one another. Indeed, I would argue that this is not advisable.

The fact that implicit pension debt is of policy relevance clearly argues for full disclosure, and the paper notes that the IMF *Government Finance Statistics Manual 2001*, with its emphasis on accrual reporting and balance sheets, provides a framework for doing this. While this is correct, recording future pensions that are yet to be accrued as a liability and future contributions as an asset presents accounting problems both from the point of recognition (determining when a liability and an obligation is incurred) and measurement (since in both cases their size is highly speculative, mainly because they can be influenced by future policies). This alone argues for keeping implicit pension debt off the government balance sheet. There are also significant potential complications involved in treating implicit pension liabilities in parallel with regular debt. Does the commitment to provide health care to the retired give rise to liability that should be treated the same as a pension liability? Should future taxes be treated as an asset, just like future social security contributions? It would be preferable to avoid such issues by undertaking regular assessments of long-term social security finances, including a calculation implicit pension debt, and then reporting the results separately from the government accounts and the balance sheet, at least until the accounting profession provides a definitive recommendation to the contrary.

Finally, the paper contains a lengthy discussion of redistribution, and notes that PAYG has redistributional implications within generations, and in particular that PAYG favors the rich over the poor because the latter, die younger, enter the labor force earlier, and have flatter age-earnings profiles. By contrast, funding is distributionally neutral, because pensions are linked to contributions. I have two observations. The first is that this is not really a comparison between PAYG and funding, but rather between defined benefit and defined contribution schemes. This should be made clear. More generally, the paper could do somewhat better in distinguishing between those features of private, funded pension schemes that reflect differences between PAYG and funding, private and public provision, and defined



benefit and defined contribution schemes respectively. The second observation is that redistributive concerns, while they can clearly be an important motivation for pension reform, do not seem to be central to the link between pension reform and fiscal deficits (and debt), indeed coming so early they tend to divert attention away from this topic. If it is retained, the discussion of redistribution needs to be better integrated into the paper, perhaps by making redistribution a concern from the outset and including some discussion of the redistributive consequences of implicit pension debt.

# THE IMPACT OF ASSET ACCUMULATION ON CAPITAL MARKETS<sup>1</sup>

JORGE ROLDÓS<sup>2</sup>

## 1. INTRODUCTION

Pension reform has generally been motivated by political and demographic pressures which threaten the financial stability of the pay-as-you-go schemes. However, the concentration on reforms directed towards schemes that are totally or partially capitalized, and managed by private bodies, has produced additional benefits for the development of capital markets. This present document evaluates some of these benefits in the light of the recent trends and debates that have occurred, both in mature markets and in emerging markets, including the series of crises that have affected various countries which have undertaken pension reforms.

Various emerging markets have undertaken pension reforms that are more ambitious than those applied in mature markets. Following the example of Chile, which gave the initial impetus to the reforms in Latin America, various other Latin American countries, and lately also countries in central and eastern Europe, have adopted variations of individual capitalization systems, with defined contributions and private management. Many countries

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<sup>1</sup> I am grateful to Augusto Iglesias for his comments and to the FIAP for providing data. The opinions expressed in this document are the author's own and do not necessarily represent those of the International Monetary Fund.

<sup>2</sup> Head of the Emerging Markets Division of the Department of International Capital Markets of the International Monetary Fund (IMF). He has a Doctorate in Economics from the University of Rochester, New York and a Master's degree in Economics from the University of Chicago. He has published articles in various specialist periodicals and is a frequent contributor to the IMF's *Global Financial Stability Report*.

consider that it is still necessary to keep up the pay-as-you-go scheme for older workers during a period of transition, and have therefore implemented what the World Bank has called a multiple pillar framework (Holzmann, 1999). In this framework, the first pillar consists of a slightly adapted pay-as-you-go scheme which continues to operate as a system of non-capitalized defined benefits. In most countries, the first pillar also offers a safety-net of social protection in the form of a guaranteed minimum pension for all workers. The second pillar of the reform is based on mandatory defined contributions which are deposited in individual accounts managed by private bodies. When the worker retires, his/her pension is determined by the contributions and the accumulated returns on the investment. In various cases the scheme may be complemented by a third pillar, made up of voluntary contributions.

In general, the result of the reforms has been favourable, especially in Chile; and in other countries they are trying to improve the regulatory framework in order to take maximum advantage of a reform which affects various areas of the economic landscape<sup>3</sup>. In an initial evaluation of the challenges presented to the countries by the pension reform (Mitchell and Barreto, 1997), six crucial elements are identified, namely: whether the scheme is to be mandatory or voluntary, how it should be funded and how its benefits should be structured, the volume and funding of the transition, and the results and regulatory structure of the system<sup>4</sup>. In this present document we concentrate on the last two aspects, as they are central to the relationship between the reformed systems and the efficiency and stability of the capital markets.

The growth of institutional investors which has occurred in the mature markets since the seventies brought with it considerable growth and structural transformation in the capital markets. In particular, Davis and Steil (2001) note a considerable displacement towards shares and bonds of household portfolios which used to be in bank deposits. In the initial stages of the reform in emerging markets there was also considerable growth in the assets managed

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<sup>3</sup> See an exhaustive evaluation of the Chilean case in Acuña and Iglesias (2001) and Diamond and Valdés-Prieto (1994)

<sup>4</sup> In a more recent evaluation, two more essential aspects are included: coverage and the appropriate management of the systems (de Ferranti, Leipziger and Srinivas, 2002)

by third parties, but so far the greatest positive impact has been seen largely in local bond markets. Despite substantial differences in demographic, institutional and financial market structures, the comparison between what has happened in mature markets and in emerging markets offers certain indications regarding potential imbalances in the growth of the demand for local securities (driven mainly by the pension funds) and the potential local supply. The local pension funds have also contributed to the development of other markets and especially in cases where the regional markets were suffering sales pressures from foreign investors.

A different and crucial aspect of the pension reform in the emerging markets has been the concentration of the portfolios in domestic bonds. Most of the time this has been a deliberate result of the regulatory limits imposed on the sector, driven by the desire to safeguard those participating in the schemes against a wide range of capital market risks and to minimize the fiscal costs of the transition to a totally capitalized system. A key aspect of policy which arises from this situation is whether the emerging markets should dismantle certain rules concerning portfolio limits and adopt general *prudent man* rules in a system of self-regulation, or proceed to a gradual liberalization of some of the stricter rules (Iglesias, 2002). A related aspect is the importance that should be given to the development of local securities markets when preparing the rules for regulating the funds. The marked differences between the countries make it difficult to draw general conclusions, and a detailed evaluation of the regulations applied by each country is beyond the scope of this present paper. Nonetheless, a further examination is given here of some of the arguments on which the main regulations are based, in the light of the recent evolution of mature and emerging markets and some contributions to academic literature which attempt to reconcile the differences between traditional portfolio theory and the advice of the financial advisors.

## 2. PENSION FUNDS AND CAPITAL MARKET DEVELOPMENT

The pension funds, like other institutional investors, offer small individual investors the possibility of pooling risks, providing better opportunities for diversification and risk/return combinations for the final investors. Their greater capacity to absorb and process information, as well as to carry out large-

volume operations, reduces the cost of intermediation and benefits both investors and issuers. In addition to offering more efficient risk management and lower trading costs, the long-term nature of their liabilities allows the pension funds to invest in and contribute to the development of longer-term securities markets. Finally, these also help to improve transparency and corporate governance and favour the improvement of the market's microstructure and the adoption of innovative financial products. Nonetheless, some analysts put forward the view that pension funds tend to follow herding behaviour patterns, so increasing the volatility of the stock market.

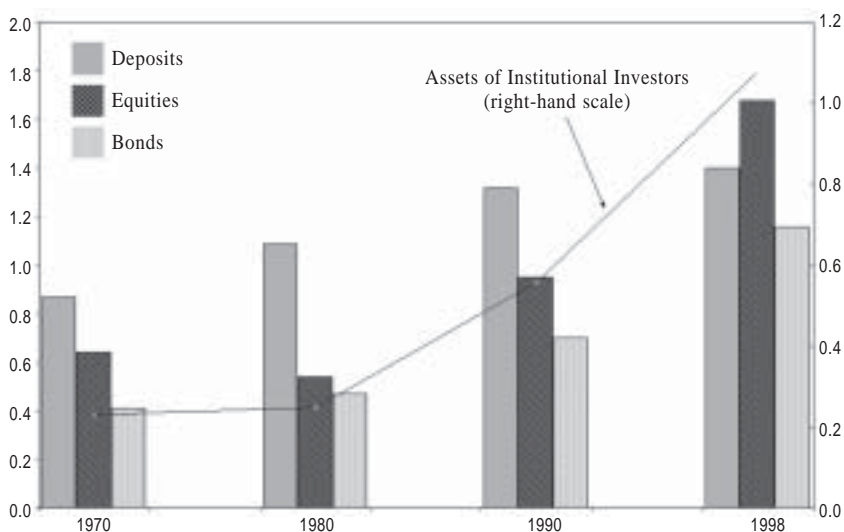
This section presents data on these subjects in the context of mature and emerging markets, paying particular attention to the systems that have been reformed recently. Pension reform generally has to do with a change from the pay-as-you-go scheme to a system which is partially or fully capitalized. A considerable proportion of the research has been dedicated to analysing whether these reforms increase the aggregate level of savings, and the empirical evidence so far has not been fully conclusive. These questions are not dealt with in this paper, because the growth of the pension funds would produce the positive effects on capital markets, regardless of their impact on aggregate saving.

## **2.1. Impact on local securities markets**

The growing importance of institutional investors in the mature markets and their positive effect on the development of stock markets have been amply documented. Davis and Steil (2001) point out that the assets of the institutional investors in the G-7 countries increased from 23% in 1970 to 108% of the GDP in 1998. In the long term, the pension funds have grown at a faster rate than other types of institutional investors, but in the last few years the mutual investment funds have shown a faster rate growth, due in part to the fact that some pension funds have delegated the management of their assets to third parties.

The growing importance of institutional investors has entailed an increase in the relative importance of stock and bond markets, at the expense of bank deposits (see Figure N° 1), in global portfolios. Davis and Steil (2001) confirm these results by panel regression techniques for mature markets, dividing the sample between Anglo-Saxon countries –which have seen a more

**Figure N° 1**  
**VOLUME OF FINANCIAL INSTRUMENTS AND**  
**ASSETS OF INSTITUTIONAL INVESTORS**  
**(AS A PERCENTAGE OF THE GDP)**



Source: Davis and Steil (2001)

pronounced growth in institutional investors—, Europe and Japan. They also conclude that there is a relation in the Anglo-Saxon countries between a larger institutional sector and a lower average volatility level in the capital market –measured by the monthly standard deviation of share prices–, but not in Europe or Japan<sup>5</sup>. In a recent paper on mature and emerging markets, which checks the effects of the other determining factors in the development of the bond and equity markets, these conclusions are confirmed<sup>6</sup>. In particular it is concluded that an increase in the proportion of total assets managed by pension funds and insurance companies produces a positive impact on the capitalization of the bond and equity market. The effect on the depth of the bond and equity

<sup>5</sup> See Davis and Steil, 2001, Tables 5.5 and 5.6

<sup>6</sup> See Impavido, Musalem and Tressel (2003). The sample includes various mature markets and also some emerging markets (Argentina, Chile, Korea, Hungary, Malaysia, Poland, South Africa and Turkey).

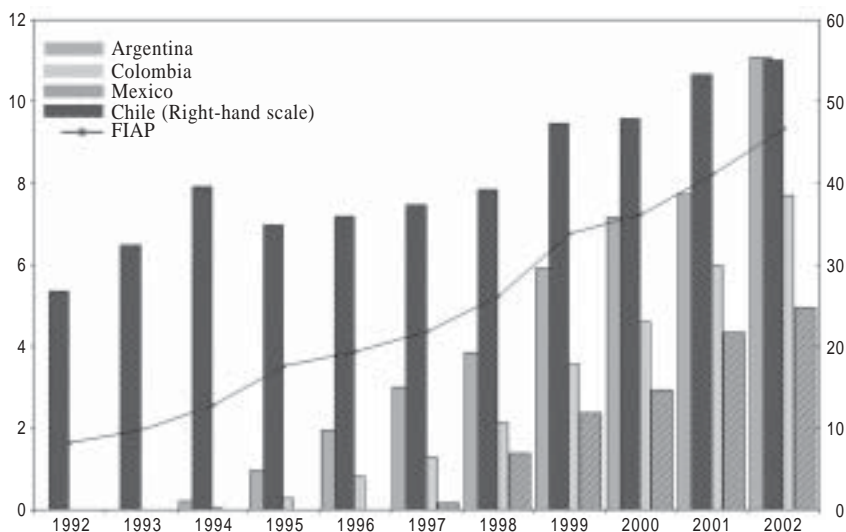
markets is stronger when the financial system is not dominated by banks, if there is not too much international trading in securities and if the contributions to the pension plans are mandatory.

In these studies, a considerable degree of contemporary correlation is to be seen between institutional investment –including that of the pension funds– and the development of the stock markets, but it might be asserted that this does not necessarily mean that there is a causal relationship. In fact, some authors (Davis 1995, Davis and Steil, 2001) suggest that the development of the stock market is a pre-requisite for the growth of institutional investors. In order to elucidate this matter, Catalan, Impavido and Musalem (2000) carried out Granger causality tests in both directions for 14 OCDE countries and 5 emerging markets, with annual dates for the period 1975-97. Although in several cases the data indicated that there was no causality in either direction, in the cases where it does exist, the direction is primarily from the institutional assets to the capitalization of the market and not the reverse. In the case of the pension funds in emerging markets, the authors conclude that in Thailand and South Africa the causality appears to run from the pension funds to the capitalization of the market, while in Chile it operates in both directions and in Malaysia and Singapore it apparently does not operate in either direction.

The reform of the pension funds has been the distinctive characteristic of various Latin American countries which, following Chile's example, have created different types of social security schemes in accordance with what the World Bank has called a multiple pillar system. The assets managed by the private pension funds in the region have risen from about 7% of the GDP in 1996 to almost 12% of the GDP in 2001 (see Figure N° 2). The assets managed in Chile have reached 55% of the GDP after operating a fully funded system for twenty years, while the other countries are only in the early stages of asset accumulation – except for Argentina, which introduced the system in 1994 and has a percentage which is over 10% of the GDP (see Figure N° 2).

The schemes are relatively new, except for Chile, and this complicates somewhat the evaluation of their impact on local capital markets. The positive effect of the growth of the assets managed by the pension funds has occurred mainly in the local bond markets. The pension funds are relatively important holders of government and corporate bonds, while their participation in the

**Figure N° 2**  
**PRIVATE LATIN AMERICAN PENSION FUNDS:**  
**MANAGED ASSETS**  
**(AS A PERCENTAGE OF THE GDP)**



Source: FIAP

stock markets is no more than 10% of the capitalization of the market (Table N° 1). However, the absolute size of these markets remains relatively small compared with the mature markets, so there is still plenty of room for growth (see the following section).

There are also indications of a very rapid growth in the issuing of local corporate bonds in Chile and Mexico in the past two years, as a result of the willingness on the part of local pension funds to acquire these instruments after the recent crises where companies lost access to the international capital markets (see IMF, March 2003, and Mathieson and Roldós, 2003). Figure N° 3 shows this substitution of sources of financing in the business sector in the case of the three largest private pension funds in Latin America. In the cases of Argentina, in the second half of the 1990s, and Mexico in the last four years, the rapid growth of local corporate bond issuance is related with the accelerated growth rate of the assets managed by the pension funds. In the case of Chile, the volume of managed assets and the depth of the existing markets

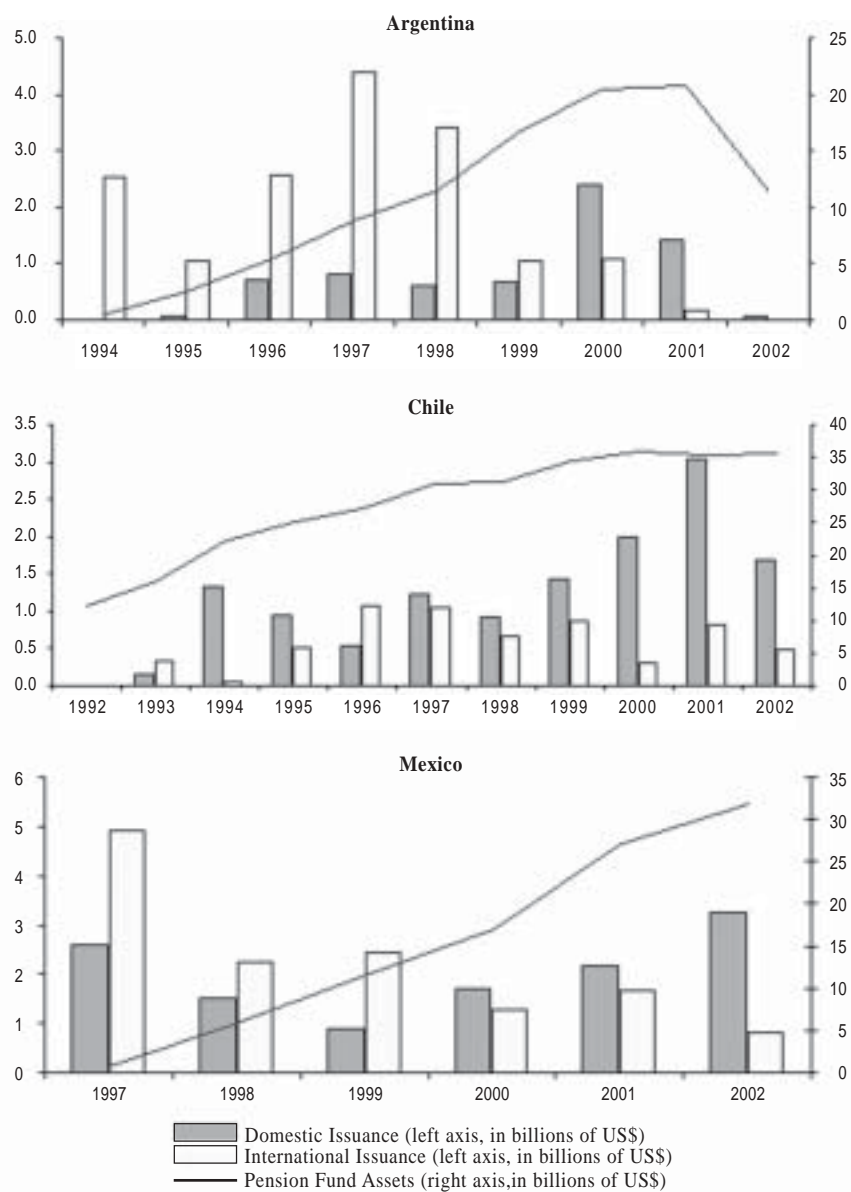


**Table N° 1**  
**SHARE OF THE PENSION FUNDS (PFS) IN FINANCIAL MARKETS**  
**(DECEMBER)**

Year	Chile				Argentina				Peru			
	Corporate Bonds		Equities		Corporate Bonds		Equities		Corporate Bonds		Equities	
	Investments (%)	Market Size (US\$ billion)	PF Investments (%)	Market Size (US\$ billion)	Investments (%)	Market Size (US\$ billones)	PF Investments (%)	Market Size (US\$ billones)	Investments (%)	Market Size (US\$ billones)	PF Investments (%)	Market Size (US\$ billones)
1992	60.3	1.97	10.0	29.13		0.50		18.33				
1993	54.9	2.06	9.9	51.37		0.93		42.93	0.0	n/a	0.0	5.08
1994	57.2	2.45	10.6	68.15		0.72	4.3	36.53	10.1	0.09	0.5	8.16
1995	53.9	2.41	10.5	72.18		2.01	10.8	37.06	26.4	0.21	0.9	11.70
1996	53.8	2.32	10.5	70.03		2.94	14.1	44.36	44.5	0.47	2.2	13.84
1997	53.2	1.90	9.7	73.76		2.55	13.8	54.29	44.9	0.70	3.0	17.38
1998	46.6	2.30	8.2	51.87				45.33	40.6	0.80	5.2	11.03
1999	48.6	2.60	6.1	68.23				83.89	0.00	0.00	6.7	13.39
2000	36.4	3.60	6.2	60.40				166.07	0.00	0.00	7.5	10.56
2001	36.6	5.60	6.3	56.31				192.50	0.00	0.00	8.1	11.13
2002	51.9	4.90	7.4	47.58				103.43	0.00	0.00	10.6	13.36

Source: Walker and Lefort; BIS, FIAP, IFS and estimated by the Staff of the IMF.

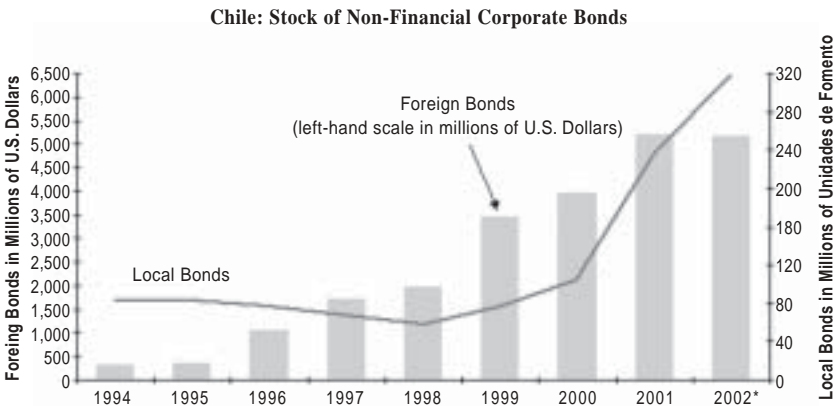
**Figure Nº 3**  
**CORPORATE BOND ISSUANCE - DOMESTIC AND INTERNATIONAL**  
**- AND TOTAL PENSION FUND ASSETS**



Source: BondWare, CapitalNet, Pension Fund Supervisory Agencies and FIAP.

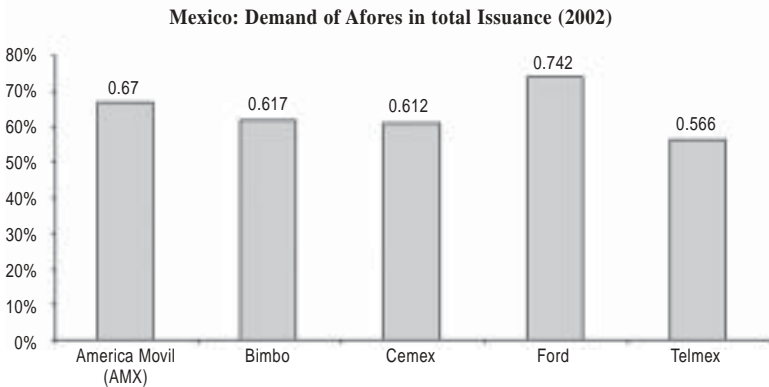
for local corporate bonds meant that the local pension funds absorbed the increase in local issues. Though we have no available proof of causality, the facts seem to support the argument - see in Figure N° 4, for example, the large increase in indexed bonds in Chile which were acquired principally by pension funds and the large proportion of Mexican corporate bonds absorbed by pension funds.

**Figure N° 4**  
**LOCAL CORPORATE BONDS AND PENSION FUNDS**



Source: Superintendency of Securities and Insurance, Central Bank of Chile.

\* Estimated.



Source: CONSAR, CSFB.

An admirable achievement in Chile's case is the creation of a long-term market for corporate bonds: as is documented in Cifuentes, Desormeaux and González (2002), the average term of the bonds issued fluctuated between 10 and 15 years in the first five years of the nineties. Lately it has fluctuated between 10 and 20 years and bonds have even been issued at 30 years. Most of the Chilean company bonds are indexed to the *Unidad de Fomento* (UF, an accounting unit linked with the CPI), and analysts maintain that the development of a market of public bonds in UF, together with the adoption of a legal framework which encourages (and occasionally requires) the use of this accounting unit, has been crucial –together with the growth of the pension funds– in the development of a long-term market for company bonds (see, for example, Walker, 2002).

The pension funds have also had an important impact on the stock markets in Chile. Walker and LeFort (2000) observe that the assets managed by the pension funds have a statistically significant effect on share prices and the cost of capital in Chile, together with a notable contribution to the decrease of volatility and sensitivity to external disruptions.

## **2.2. Impact on other financial markets**

The growth of the assets managed by the pension fund industry has brought with it various innovations and improvements in other markets and financial institutions. In particular, Walker and LeFort (2000) offer evidence that in the cases of Chile, Argentina and Peru (the countries with the longest tradition of reform), the social security reform contributed significantly to the accumulation of “institutional capital”, a combination of an improved regulatory and legal framework, greater professionalism in investment decision-making processes and an increase in transparency and integrity. They also point out that the accumulation of funds was accompanied by the growth of mortgage bonds and other asset-backed securities and the creation of closed mutual investment funds.

The insurance industry has grown rapidly in the past few years in Latin America, largely as a result of the growth of pension funds (see García Cantera et al. 2001). The expansion has been concentrated to a large extent in the life insurance sector with a pronounced increase in the sale of life annuities. When pensioners retire, they withdraw their accumulated contributions plus profits,

and have the option of buying life annuities<sup>7</sup>. The growth in the life annuity markets has not been restricted to the privatised systems and in Singapore there has also been a rapid growth in recent years due to the reform of the rules governing the Central Social Security Fund, a defined contributions scheme managed by the State (MacKenzie, 2003).

The pension funds and insurance companies have facilitated the introduction of important innovations in trading and custody of securities, as also in other auxiliary industries such as credit ratings. Acuña and Iglesias (2001) point out that both the adoption of the electronic system of trading in the Santiago Stock Exchange in 1987 and the creation of a centralized electronic system of securities custody in 1995 had their origins in the growing needs of the pension funds and insurance companies. In addition, a private risk-rating industry arose to meet the need for rating the securities to be acquired by the pension funds.

The pension fund reforms have also contributed to the modernization of the financial industry in Latin America. Analysts have considered that the integration of the management of the banking sector, insurance and pension funds is the basic model for developing the financial industry in Latin America (see García Cantera et al., 2002). In most countries in the region, except Chile, the banks can distribute insurance plans freely and are also considered to be a natural channel for selling asset management services, including the pension funds.

### **2.3. Impact on external debt markets and capital flows**

The growth in assets managed by private pension funds has not only contributed to the development of the local securities market, but has also had important repercussions on the sovereign external debt markets - and therefore on flows of capital. Brainard (2001) points out that the local pension funds and their investment guidelines have become essential considerations for investors in the foreign debt markets. The development of a local base of investors in sovereign foreign debt reduces price volatility and thus the market risk for foreign investors, but it could increase the

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<sup>7</sup> Most of the reformed systems also offer members the “programmed withdrawals” option for the rest of their lives.

risk of non-compliance if it contributes to creating unsustainable levels of global debt.

Despite the short history of some reformed systems, the hypothesis that assets managed by local pension funds offer stability to the foreign debt markets seems to have empirical backing. Using a simple multi-factor model for fixing the prices of the assets to explain the price variation of the foreign bonds of Argentina, Colombia, Mexico and Peru since 1997<sup>8</sup>, Roldós (2003) shows that the increase in the assets managed by the pension funds has a positive effect on such prices. In addition, the study demonstrates the stabilizing function of the local pension funds in the case of a heavy sale by foreign investors (reflected in a fall in the global EMBI + index).

It is likely that the favourable influence of the local pension funds will also increase shortly. In Chile, for example, the pension funds were authorised only a short time ago to invest in sovereign bonds expressed in foreign currency and it is possible that soon they will be allowed to acquire company bonds expressed in US dollars, providing support for both types of asset (see Oswald, 2002). In Mexico, most pension fund administrators consider that the use of financial derivatives will further their preference for sovereign bonds expressed in US dollars (Cervera and Query, 2003).

Although foreign investors generally benefit from the increased liquidity offered by the local pension funds, at certain excessive levels of debt the reduction in market risk is probably less than the increased risk of non-compliance. Brainard (2001), when examining the problems in Argentina, points out that the pension funds will probably adopt the position of the government in negotiating the restructuring of debts, and that the foreign creditors, bargaining power would therefore be reduced, together with the recovery value of their investments.

### 3. PERSPECTIVES, RISKS AND CHALLENGES

The arguments presented in the previous section suggest that the growth in the assets managed by the pension funds has favourable

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<sup>8</sup> According to Brainard (2001), the Colombian pension funds had the highest proportion of the foreign debt market in their country, with 13% of the total in the second semester of 2001, followed by Argentina (11%), Peru (4%) and Mexico (0.1%).

repercussions for the quantitative and qualitative development of the capital markets. The fact that the majority of systems are only in the initial stages of development would seem to indicate that it is reasonable to assume that this positive influence will continue in the medium term. Nonetheless, the serious economic and financial crises that have occurred in the last five years in the region have increased the number of challenges confronting the pension fund industry and the local stock markets.

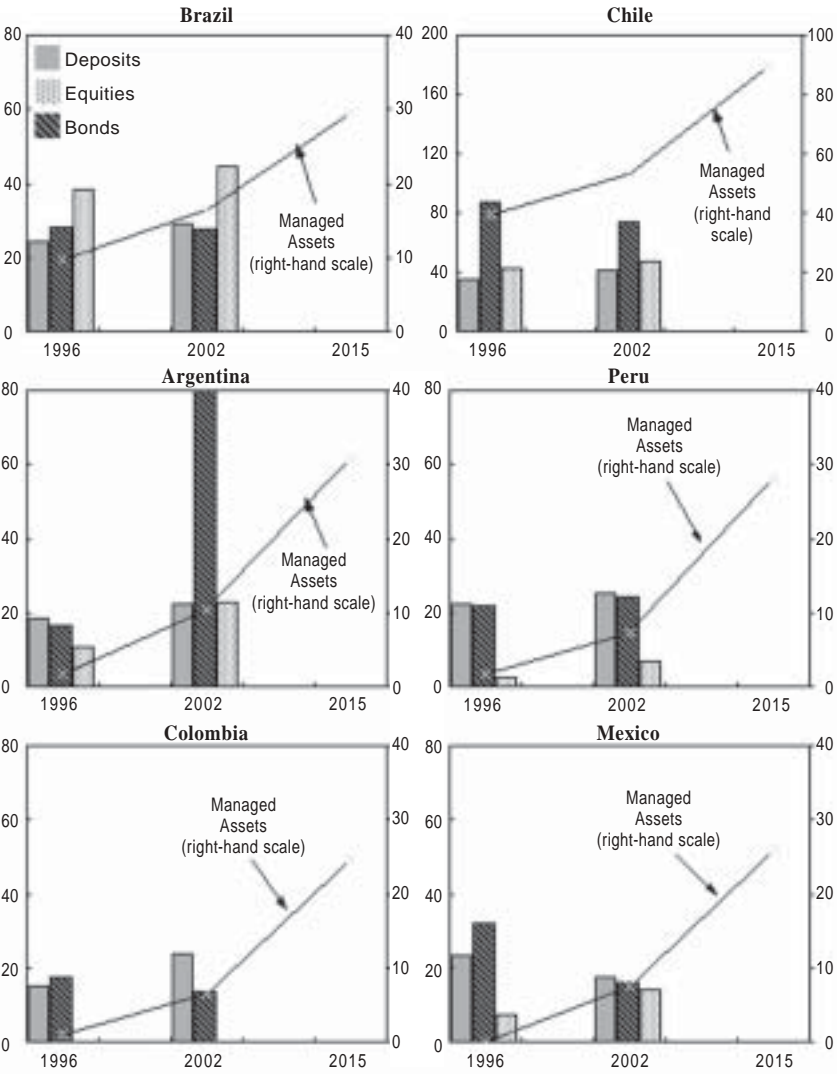
The growth of the assets managed by the pension funds will probably speed up in the coming years and this underlines the importance of modifying the regulations governing the industry and the capital markets in order to maximize the potential synergies between them. The projections of Salomon-Smith Barney (see García Cantera et al., 2002) seem to indicate that most of the systems will reach levels of approximately 25% to 30% of GDP by the year 2015, almost the same level as the average for the G7 countries in 1998<sup>9</sup>. Although the institutional, demographic and financial structures differ between the two groups of countries, the size of the stock markets in the countries that have reformed their social security systems may double (in relation to the GDP) by 2015 at the latest. One of the fundamental questions that has still to be answered, and a key challenge for the authorities that regulate the stock markets and the pension fund industry in emerging markets, is whether those markets would be able to respond to the increase in the demand of the pension funds with a sufficient volume of new securities.

The rapid growth of the managed funds contrasts with the slower growth (and even contraction in the case of equities) of the local securities markets. Despite the evidence presented in the previous section, Figure N° 5 appears to indicate that the growth rate of the demand for securities on the part of the pension fund industry has overtaken the increase in the value of the local securities that have been issued, and the acceleration of growth of managed assets in

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<sup>9</sup> See Davis and Steil (2001). The projections of SSB have the advantage of applying a common methodology for all the countries, but must be taken as an illustration. These estimations may seem somewhat cautious in view of what happened in Chile, which indicates that with a system that has been functioning for two decades, the managed assets amount to more than 50% of the GDP. However, the depth of the reforms and the demographic development, together with the spectacular results of the Chilean economy in the last two decades, might not be repeated in other systems.

**Figure N° 5**  
**LATIN AMERICA: DEPOSITS, CAPITALIZATION OF THE**  
**EQUITIES AND BONDS MARKET; MANAGED ASSETS**  
**(AS A PERCENTAGE OF THE GDP)**



Source: IMF; Salomon-Smith Barney; and S&P IFC EMDB.



the next decade might make the imbalance between the supply and demand for securities even more apparent. Another manifestation of this imbalance are the constant complaints from the pension funds about the lack of instruments for investment in local markets<sup>10</sup>.

The growing disparity between the demand and supply of securities in local markets, together with the restrictions in the pension funds' investment policies, may generate considerable distortions in the values of assets and cause a concentration of risk exposures. In order to protect the members of the pension funds against a series of capital market risks, most countries apply stringent restrictions to the portfolio, especially as regards equities and international investments. Moreover, most countries have also adopted stringent restrictions regarding the percentage of the capital of a company, or its bonds, that may be owned by a pension fund<sup>11</sup>. For example, in Argentina the funds may not own more than 5% of the capital of a company and 5% of its bonds. When the local stock exchanges are small (which is the particular case of most Latin American countries), with a limited number of companies fulfilling the requirements to participate in them, the rapidly growing funds are swiftly going to reach these limits, thus reducing their diversification possibilities<sup>12</sup>. In a more general sense, the limitations on portfolio diversification translate into a systematic market risk: greater yields can only be obtained by increasing the relative risk<sup>13</sup>.

Concentration raises the ability of the funds to influence asset prices and this in turn may distort asset allocation and amplify price volatility. The large size of the funds in relation to the markets is an obstacle to price formation: often the action of a single fund is enough to move prices. This also tends to translate

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<sup>10</sup> See, for example, Kilby, Paul: "Pension funds search for paper", IFR Latin America (April 2001)

<sup>11</sup> See, for example, Yermo (2000)

<sup>12</sup> In Chile, for example, until 1997 only 30 shares out of a total of 300 met the requirements for pension fund investment. In Argentina the fund administrators found that there were only about 14 or 15 companies listed on the Stock Exchange which met the requirements. Walker (1993) notes that the equities portfolios of the smaller Chilean funds obtain better results than those of the larger funds, but that there is no noticeable difference in the case of fixed income. He attributes this to the 7% limit fixed for fund participation in each company.

<sup>13</sup> See Srinivas, Whitehouse and Yermo (2000).

into liquidity restrictions for the funds, because they cannot sell assets without creating downward pressure on prices. For example, when the Chilean investment scheme was partially liberalized in 1985, it was difficult for the pension funds to close their fixed income positions, when faced with the liberalization, and asset allocations were modified, though very slowly<sup>14</sup>. In the same way, in Peru's case, Brady bonds pay much higher margins than local company bonds, in view of the fact that the pension funds are not allowed to invest more than 5% of their portfolio in Brady bonds compared with 40% in the case of corporate bonds.

The disparity between the growth of managed assets and the securities available, plus the associated risks, poses a policy dilemma: whether to improve the regulations for the capital market in order to accelerate its development or to liberalize the restrictions on the funds' portfolio. Mathieson and Roldós (2003) investigate some of the questions related with the first of these policy options. In the following section, there is an analysis of certain problems related with liberalizing portfolio restrictions and performance requirements.

#### **4. INVESTMENT AND PERFORMANCE RESTRICTIONS: RECENT DEVELOPMENTS AND ISSUES**

Most pension reforms have entailed strict regulations designed to protect the future retirement benefits of the workers. These regulations have included, among other things, aspects corresponding to industry structure, asset allocation and investment performance. These restrictions have important effects on the funds' asset allocation and therefore on the development of the local stock markets.

Although the restrictions on the structure of the industry and relative performance seem fairly strict, it is more difficult to draw general conclusions regarding the rigidity of portfolio restrictions. A comparison of portfolio restrictions in mature and emerging markets (Table N° 2) reveals that there are great differences between one country and another. In some G-7 countries, especially the Anglo-Saxon countries, the pension funds are

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<sup>14</sup> See Srinivas, Whitehouse and Yermo (2000).

**Table N° 2**  
**PORTFOLIO LIMITS FOR PENSION FUNDS**  
(PERCENTAGE)

	Pension Funds	
	Equities	Foreign Assets
<b>Mature Markets</b>		
United Kingdom	P	P
United States	P	P
Germany	Máx 30	Máx 20
Japan	Máx 30	Máx 30
Canada	—	Máx 20
France	—	—
Italy	P	P
<b>Emerging Markets</b>		
Argentina	49	10
Brasil	50	0
Chile	39	30
Colombia	30	10
Mexico	0	10 <sup>1</sup>
Peru	35	8
Hungary	50	30
Poland	50	5 <sup>2</sup>

Note: P indicates that the “prudent man” rule is applied.

Source: For mature markets, Davis and Steil (2001); for emerging markets, Brainard (2001), Iglesias (2002), and García Cantera (2002).

<sup>1</sup> Only sovereign bonds and Mexican corporate debt are allowed in the foreign limit.

<sup>2</sup> Brady bonds from the Polish government are not counted within this limit.

obliged to follow the typical rules for a prudent investor (“*prudent man rules*”) while in Germany and Japan a cap of 30% is established for share holdings and a similar cap for investment abroad. Although the prudent man rules are not applied in any emerging market, the funds of four of the large countries in the sample (Argentina, Brazil, Hungary and Poland) are authorized to invest half their portfolios in shares, and another group (Chile, Colombia and Peru) have a cap of between 30% and 40%. The exception is Mexico which, together with various smaller

countries in the region, does not allow pension funds to be invested in shares.

The differences are somewhat more obvious in the case of actual portfolio allocation. While pension funds in the USA and UK hold 60% or more of their assets in shares, those in Japan hold 30% and those in Germany almost nothing (see Figure N° 6). It is interesting to note that in two relatively small mature markets, Denmark and the Netherlands, the pension funds hold almost half their assets in shares. By contrast, the pension funds in emerging markets hold smaller proportions of their portfolios in shares. In Central Europe, Poland is outstanding with an allocation of 27% in shares, while Hungary and the Czech Republic hold 15% and 11% of their portfolio, respectively, in shares. In Latin America, the Peruvian funds hold 33% of their portfolios in shares, while the Brazilian funds have about 27%, the Chilean funds, 23% and those of Argentina and Colombia, under 10%<sup>15</sup>.

The countries that have reformed their social security systems hold a large proportion of their portfolios in government bonds<sup>16</sup>, except for Peru and Chile (which hold, respectively, 9% and 36% in 2000, see Figure 7) In the country which introduced reforms most recently, Mexico, the pension funds had about 90% of their portfolio in government bonds, but this percentage had fallen to 81% by the close of 2002<sup>17</sup>. The pension funds in Argentina and Colombia held about half their portfolios in government bonds at end-2000.

It is more difficult to find coherent information about holdings of foreign securities, but the pension funds in the mature markets seem to hold slightly higher allocations than those of the emerging markets. In the pension funds of mature markets the allocations corresponding to foreign assets are equivalent to about 10% in the case of the USA and Japan, while other smaller countries have relatively higher allocations (19% in the case of the UK funds and 24% in that of the Netherlands, see Davis and Steil, 2001). In the

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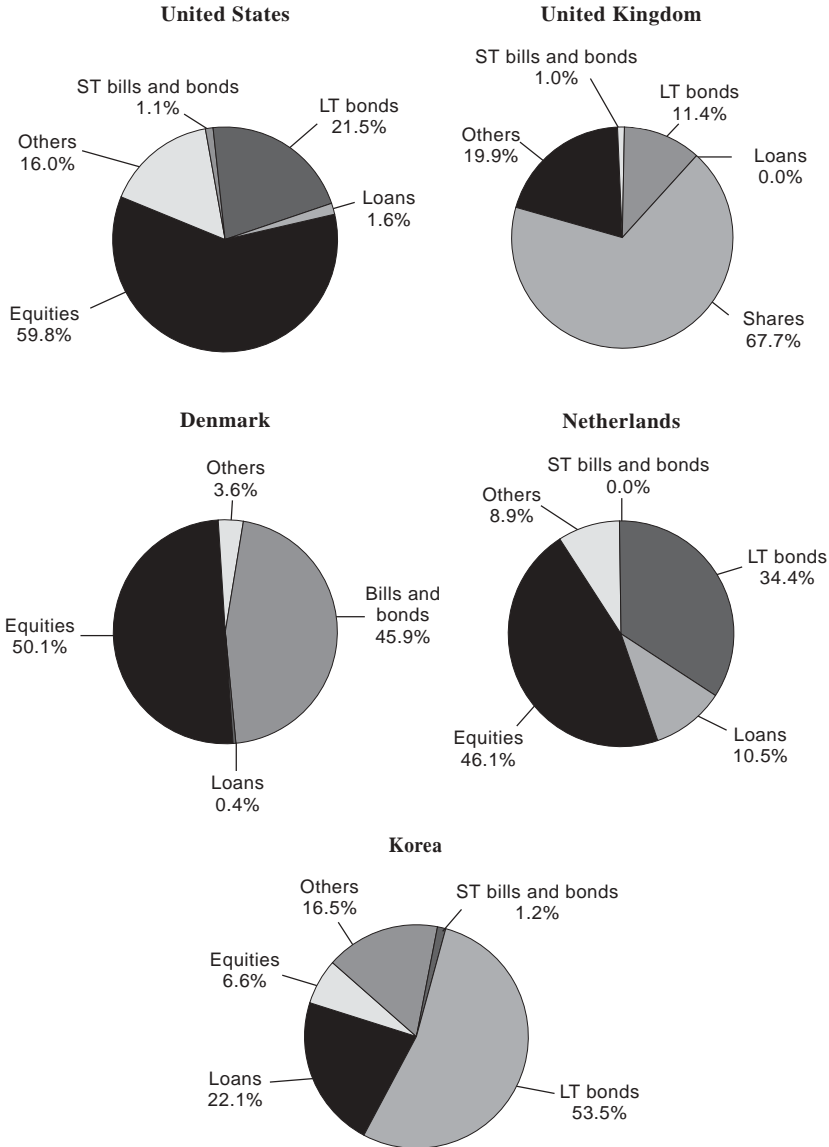
<sup>15</sup> In the cases of Chile and Peru, 14% and 15% respectively are invested in foreign shares, while in Brazil, 9% corresponds to local mutual investment funds.

<sup>16</sup> Including Central Bank securities.

<sup>17</sup> The pension funds in smaller countries also have a large share of government bonds in their portfolios, with figures amounting to 73.5% in the case of Bolivia, 83.4% in El Salvador and 57.6% in Uruguay at close of May 2002 (see Iglesias, 2002).

**Figure N° 6**  
**PENSION FUND PORTFOLIOS (2000<sup>1</sup>)**

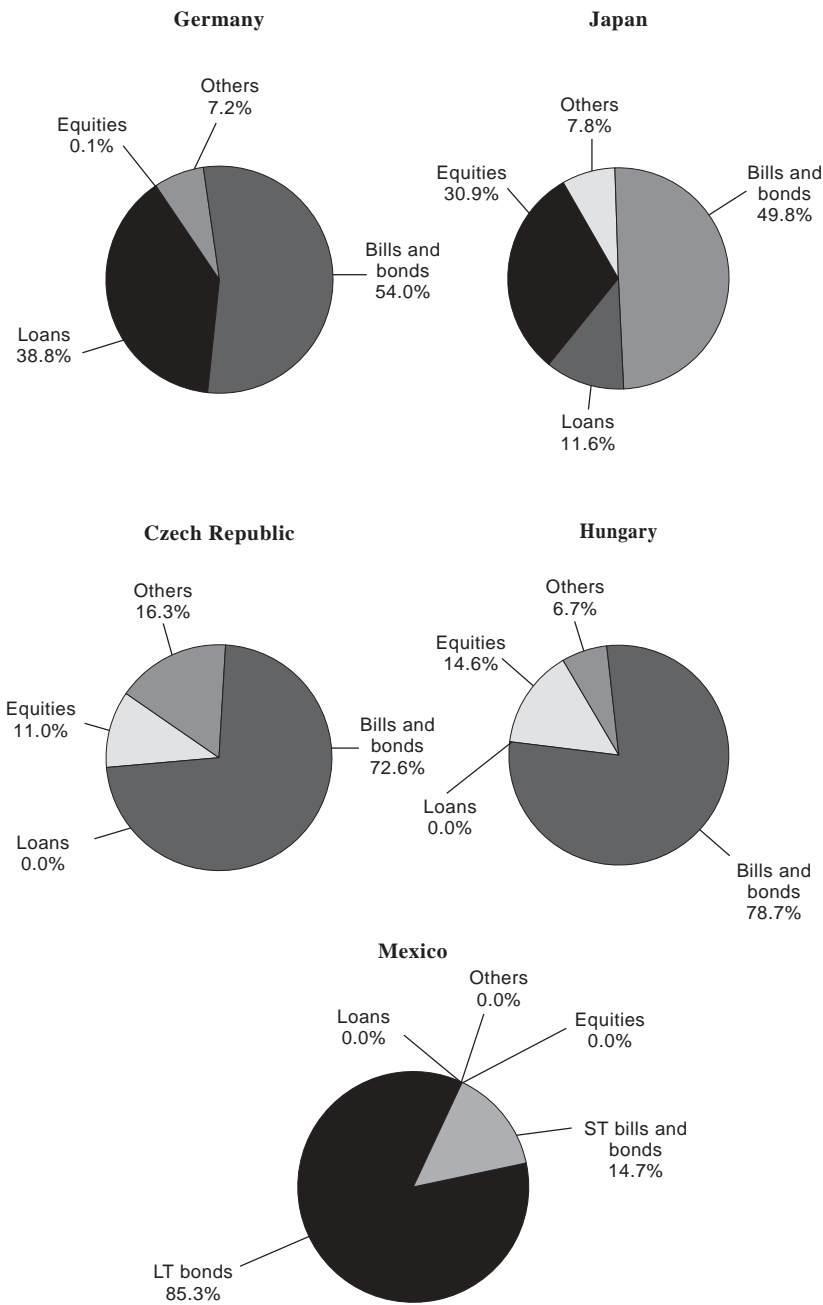
**Part A**



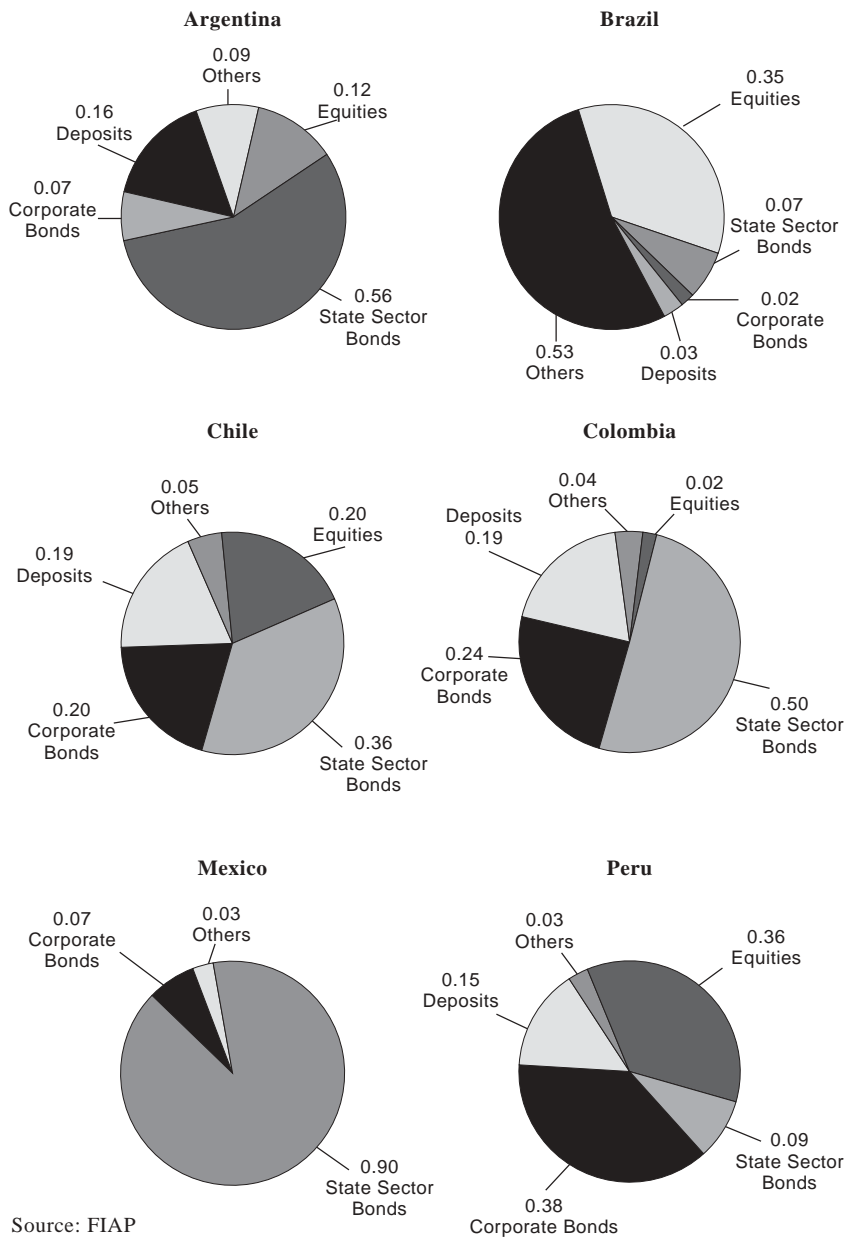
Source: OCDE Institutional Investors Statistical Yearbook.

<sup>1</sup> 1999: Czech Republic, Denmark, Japan and United Kingdom.

Part B



**Gráfico N° 7**  
**LATIN AMERICA: PRIVATE PENSION**  
**FUND PORTFOLIOS (2000)**



Source: FIAP

emerging markets, Chile has the highest proportion of pension fund assets invested in foreign securities (15%), followed by Peru (7%) and Argentina (6%).

A key aspect of policy is whether the emerging markets should dismantle the portfolio limits and change to the self-regulatory framework corresponding to the prudent man rule, or should gradually liberalize some of the stricter regulations (Iglesias, 2002). An associated aspect is the importance which should be given to the degree of development of the local stock markets when constituting the regulations corresponding to the funds. The great differences between countries make it difficult to draw conclusions, and an evaluation of the norms applied by each country is beyond the scope of this document. However, in the following sections we shall once again be examining some of the arguments on which the regulations are based, in the light of the recent evolution of mature and emerging markets.

#### 4.1. Equities versus bonds

Modern financial theory provides useful information on the decisions of individuals with regard to portfolio allocation, but some of its results are inconsistent with the financial advice of the professionals working in the sector. One of the results emerging from the traditional analysis based on the mean and variance of returns is that all the investors have to hold the same portfolio of risky assets, in other words, a single, optimum combination of equities and bonds. Conservative investors will hold a relatively greater quantity of cash (and less of the optimum portfolio of risky assets) than more aggressive investors. This strong result of a single portfolio is Tobin's mutual fund theorem (1958). As Canner and others (1997) point out, this result contrasts strongly with the advice offered by financial planners. The authors, using data from the United States corresponding to the period between 1926 and 1992, conclude that the optimum portfolio should contain bonds and equities in a ratio of 0.33 to 1<sup>18</sup>. Table 3, based on their research (see also Campbell and Viceira, 2002), shows that the advice given

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<sup>18</sup> Another slightly more complex practical guideline states that the fraction of assets invested in shares should decrease with age. In general, the empirical rule which is applied states that the percentage of shares should be equivalent to 100 minus the age of the person. A person 30 years old should invest 70% in shares and one 70 years old should invest 30% in shares (Bodie, 2001).



**Table N° 3**  
**THE “PUZZLE” OF ASSET ALLOCATION BY CANNER *ET AL.* (1997)**

Advisor and type of investor	Percentage of the portfolio			Ratio of bonds to equities
	Cash	Bonds	Equities	
Fidelity				
Conservative	50	30	20	1.50
Moderate	20	40	40	1.00
Agressive	5	30	65	0,46
Merrill Lynch				
Conservative	20	35	45	0.78
Moderate	5	40	55	0.73
Agressive	5	20	75	0.27
Jane Bryant Quinn				
Conservative	50	30	20	1.50
Moderate	10	40	50	0.80
Agressive	0	0	100	0.00
New York Times				
Conservative	20	40	40	1.00
Moderate	10	30	60	0.50
Agressive	0	20	80	0.25
Average				
Conservative	35	34	31	1.01
Moderate	11	38	51	0.75
Agressive	3	17	80	0.21

Source: Canner *et al.* (1997).

by the asset managers and financial planners varies considerably from one client to another, depending on the degree of risk aversion. On average, conservative investors tend to keep their allocation in bonds similar to that in equities.

Campbell and Viceira (2002) modify the traditional academic analysis for selecting portfolios in various ways in order to reconcile the principle of portfolio selection with the advice of the financial planners. More concretely, these authors show that the optimum portfolio for long-term investors may be very different from that of short-term investors, and that the analysis on a long-term horizon gives a far more important function to bonds in the

optimum portfolio. For example, although cash, or more concretely, investment funds in the money market or in Treasury bonds constitute a risk-free asset in traditional analysis, they represent risky assets for long-term investors, because that have to be rolled-over at uncertain interest rates in the future. Traditional long-term bonds (in environments with a low level of uncertainty with regard to inflation), or index-linked bonds, constitute risk-free assets for the long-term investor.

Moreover, the authors show that in incomplete financial markets –a reasonable assumption in the case of emerging markets– the variable evolution of the volatility of the returns on the equities justifies a reduction in equities (of approximately 10% in the case of United States, and presumably more in the case of an emerging market). In addition, the property which makes equities safer in the long than in the short term –their reversion to the mean– also refutes the argument in favour of “buying and holding” and justifies a certain degree of optimisation of the moment of entering the market. This type of optimisation of the moment of entering the market does not imply a high frequency of stock market deals related with “tactical” asset allocation programmes, but rather a more gradual “strategic” re-allocation of assets. In concrete terms, Campbell and Viceira (2002) point out that this would mean that the optimum asset allocation might be lower than that derived from the traditional analysis of the short-term portfolio in cases where the returns on equities increase drastically, as occurred at the end of the millennium<sup>19</sup>. Finally, the authors also show that though the optimum solution for young investors may be to hold more shares, this recommendation should be tempered if the investors have relatively insecure jobs and/or have a level of consumption that is close to subsistence, two characteristics that are typical of workers in emerging markets.

One of the main reasons why the proportion allocated to equities is high in some mature markets are the high surplus returns on the shares, particularly in the United States. Although the determining factors of this risk premium for shares are not fully understood, there are various reasons why it is advisable to be cautious when extrapolating this historic data to the future and/or other countries.

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<sup>19</sup> If this recommendation had been followed, some of the difficulties currently being faced by the pension fund sector of the mature markets could have been avoided.

First, it is quite possible that the historic returns will not be repeated in the future. Second, the data on the risk premium for shares is based on long-term series (which sometimes cover periods of over a hundred years) and although, on average, shares produce better results than bonds, the possibility that the results may not be better over shorter periods constitutes a considerable risk for pensioners. For example, McCurdy and Shoven (2001) demonstrate through simulations that, in 25% of cases, share investments give less satisfactory results than bonds that are index-linked to inflation with a horizon of 20 years. Third, Jorion and Goetzman (1999) maintain that the results of equity markets in the United States suffer from a “survival bias”, in other words, the fact that the results of other world stock markets were far less satisfactory, due to extreme events such as crises, wars, expropriations or political upheavals, which led to the temporary, or even permanent closure of some stock markets. In fact, the authors show that the real average historic returns in the United States are 4.3% since 1921, as compared with 3.4% in other world markets - and an average return median of only about 0.8% (see Table N° 4).

The series of crises that have occurred in the emerging markets since 1994 and the recent exploding of the stock market bubble in

**Table N° 4**  
**PERFORMANCE OF GLOBAL STOCK MARKETS**

<b>Index</b>	<b>Arithmetic return</b>	<b>Risk</b>	<b>Geometric return</b>	<b>Final wealth</b>
U.S. index	5.48	15.83	4.32	27.3
Global index				
Surviving markets	4.98	12.08	4.33	27.3
All markets	4.59	11.05	4.04	21.9
Non-U.S. index				
Surviving markets	4.52	10.02	4.09	22.2
All markets	3.84	9.96	3.39	13.1

Source: Jorion and Goetzmann (1999).

Nota: Final wealth gives the final value of US\$1 invested in December 1920 at the end of the sample.

the sectors of technology, the media and telecommunications, together with the structural changes undergone by the world stock markets, have been an inexorable reminder of the risks attached to investments in shares. The bear market in shares has contracted volumes being traded all over the world and the reduction in initial public offering related with the fall in privatisations, together with cases of de-listing from the stock exchange, have also raised doubts about the viability of various stock markets in emerging economies (see Mathieson and Roldós, 2003). In various emerging markets, only a few shares have the market capitalization and liquidity necessary to satisfy the demands of a prudent fund manager. An example of this problem is the small number of shares that form part of the IFC Index of Securities for Investment, compared with the total number of shares traded in some markets (see Table 5)<sup>20</sup>. In Peru, for example, of the 202 companies quoted on the stock exchange, only 9 are sufficiently large and liquid to be included in the S&P/IFCI; however, these nine shares make up 94% of the volume traded on the country's stock exchange.

Despite these recent arguments that it is not a good idea to hold a large proportion of the pension funds' portfolios in shares, and that recent results for shares have been dismal throughout the world, the principles of diversification suggest that local shares should undoubtedly be included in local pension fund portfolios. Investors with a relatively long time-horizon, such as those who have just become part of the active population, may benefit from the risk-return configuration of shares, where the risk is calculated in relation to the existing portfolio. It is also likely that the current bear market will change in the medium term and, though it is very difficult to determine the long-term development of markets, the more important emerging markets will probably continue to be a viable source of operations for investors and of funding for companies.

In Table N° 6 there is an example of the advantages of diversification and how the fact of concentrating solely on the volatility of share markets alone can be misleading. The table contrasts, from the point of view of North American and European investors, the development of the respective markets for shares

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<sup>20</sup> In order to select the shares that make up the S&P/IFCI, a minimum level of capitalization and activity on the stock exchange is taken into account, as also limits to foreign investment (if relevant).

**Table N° 5**  
**NUMBER AND PARTICIPATION OF SHARES IN THE INVESTABLE S&P-IFC INDEX**

	Number of listed companies	Number of shares in the IFCI	Participation of companies listed in the IFCI (As a percentage)	Participation of the IFCI in capitalization (As a percentage)	Participation of the IFCI in the volume traded (As a percentage)
<b>Latin America</b>					
Argentina	83	11	13.3	2.3	76.0
Brazil	399	63	15.8	35.3	69.2
Chile	254	29	11.4	35.5	82.2
Colombia <sup>1</sup>	126	6	4.8	14.8	47.4
Mexico	166	40	24.1	47.0	87.4
Peru	202	9	4.5	28.9	94.2
<b>Asia</b>					
China	1,235	74	6.0	8.7	15.0
Korea	1,518	150	9.9	59.8	46.1
Malaysia	865	76	8.8	26.5	64.3
<b>Europe</b>					
Czech Republic	78	6	7.7	16.1	96.1
Hungary	48	8	16.7	54.9	94.3
Poland	216	20	9.3	30.6	88.3

Source: S&P IFC, *Emerging Market Database*.<sup>1</sup> Data for Colombia are as of the end of October 2001.

and bonds, the world markets and a series of pension fund portfolios which combine such shares and bonds in different proportions. Despite the steep fall in share prices between September 1999 and September 2002, the returns on the pension fund portfolios were reasonable over a period of 3 to 5 years. The representative portfolios with 50% (or less) of their allocation in shares managed at least to hold their value during those three critical years, and obtained reasonable returns in five years.

In general, the portfolio regulations governing equity holdings in most of the countries that have reformed pensions do not seem unduly restrictive (except perhaps in the case of Mexico and some of the smaller countries)<sup>21</sup>, and apparently the decision to keep the present low allocations for shares has not been a mistake. Going forward, however, there may be a margin for liberalizing the restrictions regarding shares yet further, with allocations corresponding to foreign shares or mutual investment funds performing an important role (see following paragraphs). As Walker and LeFort (2000) point out, the increase of local shares in asset allocations has helped to underpin the price/book value ratio in Argentina, Chile and Peru and the same support may be foreseen in primary stock markets. This would justify the fact of giving a certain importance to the argument in favour of developing the local stock market, allowing a larger proportion of pension fund investment to be in local shares. However, it remains to be seen how effective the demand from the pension funds may be in the development and growth of local stock markets which are under heavy competitive pressure from world and regional markets. In particular, Claessens, Klingebiel and Schmukler (2002) have shown that countries which apply good policies to develop their own stock markets also see the highest degree of migration of activities that involve obtaining capital, listing on the stock market and trading of securities to international stock markets<sup>22</sup>.

The relatively high allocation in government bonds in the portfolio is the natural result of the first stages of a pension reform, but

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<sup>21</sup> Last year, Mexico passed laws authorising investment in shares, but the regulatory body has not yet approved the application of the new portfolio regulations (see IMF, 2003 and Cervera and Quedry, 2003).

<sup>22</sup> The authors include macroeconomic and capital market variables, such as inflation, shareholders rights and financial liberalization, but do not refer specifically to the function of the pension funds; it might be expected that these would perform a similar function (see also Mathieson and Roldós, 2003).

**Table N° 6a**  
**RETURN ON SHARES AND PENSION PORTFOLIO:**  
**VIEW OF THE AMERICAN INVESTOR**  
 (RETURNS IN US\$ AS OF 30TH SEPTEMBER 2002)

	12 months %	3 years annual %	5 years annual %
<b>Return on Shares</b>			
MSCI US	-21.77	-13.95	-1.94
MSCI World ex US	-15.04	-13.93	-5.19
MSCI Emerging Markets Free	-8.15	-10.13	-9.92
<b>Benchmark Pension Portfolio</b>			
Portfolio I	-2.16	0.07	3.80
Portfolio II	-8.47	-4.60	1.78
Portfolio III	-14.79	-9.28	-0.25

Source: Morgan Stanley Global Pensions Group, November 2002.

Portafolio I: 40% Shares (90% Domestic, 10% foreign)  
 60% Fixed Income (including 10% foreign)

Portafolio II: 60% Shares (10% foreign)  
 40% Fixed Income (10% foreign)

Portafolio III: 80% Shares (10% foreign)  
 20% Fixed Income (10% foreign)

**Table N° 6b**  
**RETURN ON SHARES AND PENSION PORTFOLIO:**  
**VIEW OF THE EUROPEAN INVESTOR**  
 (RETURNS IN EUROS AS OF BOTH SEPTEMBER, 2002)

	12 months %	3 years annual %	5 years annual %
<b>Return on Shares</b>			
MSCI EMU	-28.87	-13.55	-1.97
MSCI World ex EMU	-24.91	-11.80	-1.56
MSCI Emerging Markets Free	-0.33	-7.86	-7.85
<b>Benchmark Pension Portfolio</b>			
Portfolio I	5.01	4.96	5.56
Portfolio II	-1.73	1.21	3.95
Portfolio III	-8.48	-2.54	2.34
Portfolio IV	-15.22	-6.29	0.72

Fuente: Morgan Stanley Global Pensions Group, November 2002.

Portfolio I: 10% Shares (50% European, 50% rest of the world)  
 90% EMU Fixed Income

Portfolio II: 30% Shares (50% European, 50% rest of the world)  
 70% EMU Fixed Income

Portfolio III: 50% Shares (50% European, 50% rest of the world)  
 50% EMU Fixed Income

Portfolio IV: 70% Acciones (50% EMU, 50% rest of the world)  
 30% EMU Fixed Income

creates an undesirable concentration of risk in sovereign debt. This relatively high allocation in government bonds would be justifiable for three reasons. In the first place, the larger issue of government bonds would facilitate the transition to a capitalization system and lessen the problem of the transition generation having to “pay twice”, in other words, pay the contributions to the pay-as-you-go system to finance the benefits of those who have already retired and save at the same time for their own future retirement (Campbell and Feldstein, 2001). Secondly, in the early stages of the reform, the pension fund administrators had little experience in managing risks and had to undergo a learning process which began with lower-risk government bonds. Thirdly, local bond markets tend to be relatively under-developed and it is a good plan for the government to take the initiative and establish a yield curve that will contribute to determining the price of bonds in the business sector, as also the acceptance and use of index-linked bonds (see Mathieson and Roldós, 2003).

However, the recent crisis in Argentina has highlighted the risks involved in a high concentration of sovereign risk. When the government tried to reduce the cost of servicing the debt in 2001, the pension fund administrators and banks had to take decisions with regard to the allocation of assets that they would probably never have taken in other market conditions (see García Cantera et al. 2001). The suspension of payments, devaluation and “pesification” of deposits and local bonds which occurred subsequently generated losses for the pension funds and has aroused concern about increased government intervention in the industry<sup>23</sup>.

It would also be possible to liberalize the strict requirements establishing a minimum acceptable level for corporate bonds, but the development of the corporate bond market at medium level or below takes time and regulations must be modified prudently. As was mentioned in Section 2, the pension funds have contributed notably to the development of corporate bonds in Chile and Peru. In the same way, the reduction of the mandatory rating from AA to A- has contributed to the increase in the proportion of corporate

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<sup>23</sup> However, the Superintendency of Pension Funds (SAFJP, 2002) points out that the pension fund administrators have managed, to a large extent, to avoid the fall in value of the assets in real terms, although the value in dollars of the managed funds was considerably reduced.



bonds in the Mexican pension funds from 7.2% in the year 2000 to 16.2% in 2002. It seems likely that moving down the credit ladder will take longer, because the creation of a credit culture takes a long time and must be complemented by the application of other measures that favour the development of the capital markets (see Mathieson and Roldós, 2003).

## **4.2. Domestic versus foreign securities**

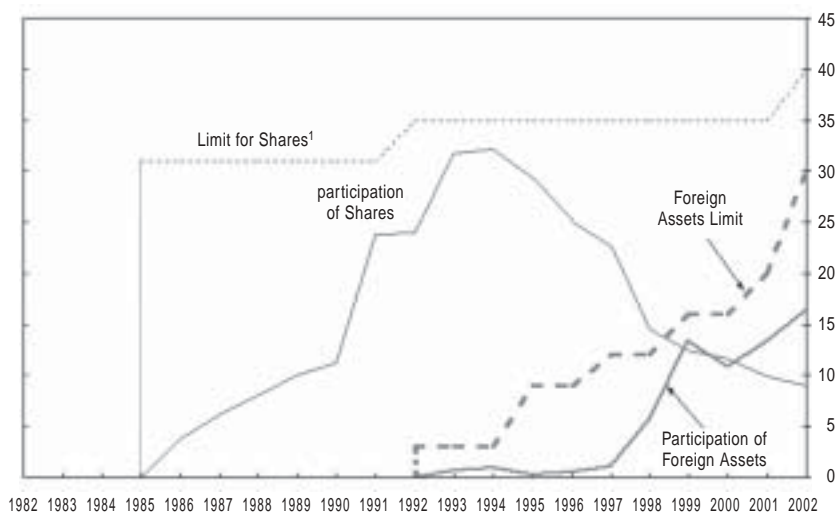
The theory of management for international portfolios would seem to indicate that diversification abroad can have considerable advantages, due mainly to the additional diversification of non-systematic national risks. Various papers (for example Grauer and Hakansson, 1987) indicate that the advantages offered by the diversification of portfolios towards foreign securities is important, but the “national bias” shown by investors in most of the mature markets continues to be a phenomenon that is difficult to explain. However, the advantages of the diversification of investments worldwide are not constant, and they seem currently to be less than at other periods in history (Goetzman, Lingfeng and Rouwenhorst, 2001). In fact, the present period of greater openness and globalisation has increased the correlations between markets, and this has reduced the gains involved in diversification to a large extent, leaving only those derived from the addition of marginal markets. Although these results correspond mainly to investors in mature markets, it is likely that the advantages of international diversification will be greater for small economies which have much less diversified production structures.

In a recent paper on the advantages of international diversification from the point of view of North American investors, two important sources of benefits stand out (Baxter and King 2001). First, there are the usual advantages of diversification which improve the risk-return ratio of the national portfolios by incorporating foreign shares and bonds. Second, the authors point out that human capital represents a much more important fraction of wealth than financial assets, and the correlation between labor income and the returns on national financial assets is greater than that of the returns on foreign assets. Therefore, international investment also has advantages in the area of risk hedging for labor income. From the calculations made, it can be seen that given a degree of relative risk aversion of 5, in an optimum portfolio 64% would be allocated to risk assets, including 26% in international securities.

The allocation of an optimum portfolio to risky assets (including the international ones) decreases almost proportionately to the degree of risk aversion, but the allocation to foreign assets increases 10 percentage points if uncertainty regarding labor income is included<sup>24</sup>. In addition, these allocations are calculated only for equities and, given the fact that correlations between bonds and equities are relatively lower, the authors assume that the optimum allocations to foreign assets would increase in a portfolio that contains bonds.

Some of the countries which have reformed pensions have increased the limits for foreign assets and what has occurred in Chile is a good example of this. Only a decade after the private pension funds were created, authorization was given to invest

**Figure N° 8**  
**CHILE: INVESTMENT LIMITS FOR PENSION FUNDS**  
(AS A PERCENTAGE OF THE PORTFOLIO)



Source: FIAP; JP Morgan Chase; Salomon Smith Barney; and PrimAmérica Consultores

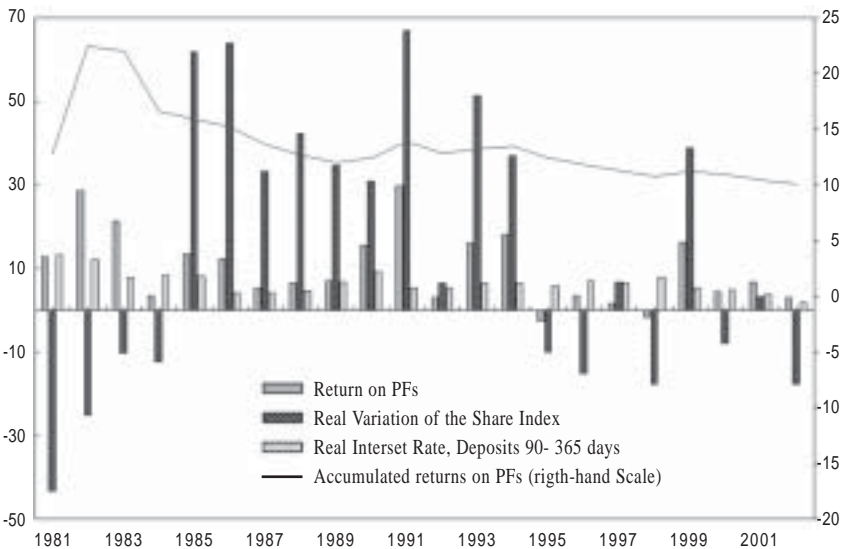
\* 2002 is a weighted average of the 5 fund-types.

<sup>24</sup> This would imply that, given a risk aversion at an interval of (5, 10), the optimum allocation in international assets from the point of view of North American investors would be between 23% and 36% of the assets; the percentage could be higher in the case of small emerging markets.

up to 3% of the portfolio in foreign assets (see Figure 8). The limit was subsequently increased to 9% in 1995, 12% in 1997, 20% in 2001 and since June 2002 it has been 30%. The pension funds did not diversify their portfolios abroad to any considerable extent until the second half of the nineties, due to the high returns on local assets (see Figure 9). However, two years after strong negative returns had been recorded in the local stock markets, in 1997 solid re-allocation towards foreign assets began, and at present the funds hold about 16% of their assets abroad. At the same time there has been a recovery of the annual returns on the funds, due in part to the depreciation of the local currency.

Some analysts consider that the Chilean regulations are excessively strict and suggest that other countries introducing reforms could use a slightly less gradual approach in authorizing foreign investments. In order to evaluate this recommendation, we

**Figure N° 9**  
**CHILE: RETURNS ON PENSION FUNDS**  
**AND FINANCIAL ASSETS**  
(AS A PERCENTAGE)



Source: PrimAmérica Consultores.

have carried out a simple exercise based on the Chilean experience, but allowing the investment of a greater proportion in foreign assets as from 1993. We created two synthetic portfolios in which the relative proportions of international shares and an international index-linked bond are greater than those of the present portfolios (Table N° 7). The “theoretical” portfolio is based on some of the allocations proposed in the paper by Baxter and King (in other words, 52% in risk-free local assets, including index-linked local bonds) while in the “international portfolio”, 25% is allocated to international index-linked bonds and a similar percentage to foreign shares. The average return of the portfolio does not show much variation, but the “theoretical” one reduces the standard deviation of the ex-post returns.

These results are only an illustration, but they seem to indicate that a greater degree of international diversification could have been achieved earlier than when the Chilean pension funds did so.

**Table N° 7**  
**CHILE RETURN-RISK OF THE PENSION FUNDS**  
(AS A PERCENTAGE)

	1981-2002			1993-2002		
	Real return (compound)	Standard Deviation	Return adjusted for risk	Real return (compound)	Standard Deviation	Return adjusted for risk
<b>Chile-pension Funds (portfolio real)</b>	13.56	3.28	4.13	6.26	7.29	0.86
<b>Portfolio I (theoretical)</b>	13.55	3.27	4.14	6.17	6.47	0.95
<b>Portfolio II (international)</b>	13.54	3.26	4.16	6.10	7.74	0.79

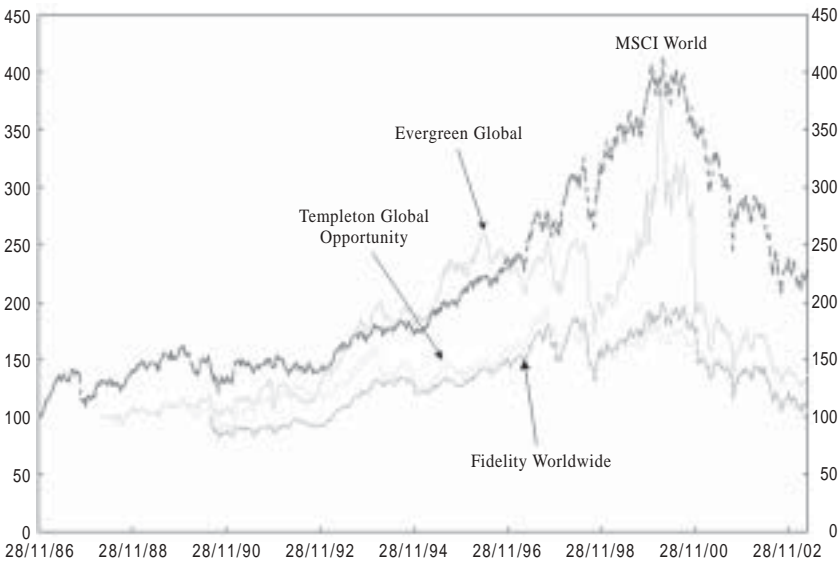
Source: PrimAmérica Consultores; and own estimates

Portfolio I: 15% Time deposits  
51% Indexed Bonds (37% Domestic, 14% Foreign)  
34% Shares (20% Domestic, 14% MSCI World)

Portfolio II: 10% Time deposits  
50% Indexed Bonds (25% Domestic, 25% Foreign)  
40% Shares (15% Domestic, 25% MSCI World)

However, it is worth giving a few warnings. First, as shown in Figure N° 10, the mutual funds invested in international shares have not been able to replicate the returns of the MSCI world index to any great extent. Second, a more extensive list of assets and techniques for managing assets and liabilities could be used, as Muralidhar suggests (2001)<sup>25</sup>. Third, the portfolios do not cover the exchange rate risk of foreign investments. However, although the optimum portfolio would be the world portfolio partly hedged against currency risk, there is no simple, practical solution nor an unquestionable reference parameter, from the theoretical point of view, for currency hedge ratios. (Solnik, 1998)<sup>26</sup>.

**Figure N° 10**  
**GLOBAL STOCK MARKETS AND MUTUAL FUNDS**



Source: Bloomberg.

<sup>25</sup> The authors show that the 30% limit imposed in Canada is damaging and could be improved by allowing 40% in foreign assets.

<sup>26</sup> In addition, according to Solnik (1996), "there never will be" (page 49). By contrast, Muralidhar, van der Wouden and Prajogi (2001) observe that the joint optimisation of asset allocation and the coefficients of exchange risk coverage may improve the ratio of assets-liabilities in the pension funds.

It is difficult to determine exchange risk, but it is important to point out that exchange risk is also present in a purely local portfolio, because there are companies which compete in world markets. Also, the recent crises in the emerging markets have been related with the abrupt falls in local share prices and the value of currencies. A large proportion of internal assets could therefore cause a “double whammy” to local pension fund returns<sup>27</sup>.

Two final considerations regarding improved foreign asset allocation: first, a macroeconomic consideration. The liberalization of the limits to allocation in foreign assets may lead to outflows of capital and a depreciation of the currency. As a matter of fact, the liberalization of investments abroad contributed to a considerable depreciation of the Chilean peso at the beginning of 1999<sup>28</sup>. Secondly, the allocation of funds to foreign assets to some extent prevents the local market benefiting from an important source of demand. However, as was pointed out previously, it is possible that the supply of local securities would be unable to grow at the same rate as that shown by the managed funds. Also, when the local market reaches a certain level of development, the funds that are sent abroad can be brought back if the risk-return configuration of the national market improves, as has been shown by the recent boom of corporate bonds in the Chilean markets.

### 4.3. Financial derivatives

Financial derivatives are efficient instruments for managing risk and can be used for hedging risks or improving returns. In one survey carried out in 1995, of 200 pension funds in mature markets, more than 30% were using some type of derivatives (including futures on share indexes, options and swaps), and it is possible that this proportion has increased since then (Muralidhar, 2001). The use of derivatives must be complemented by adequate risk management within the institution and appropriate regulations applied by the supervisory bodies, especially in emerging markets (see Mathieson and Roldós, 2003). Some of the countries which have carried out pension reforms have allowed a limited use of derivatives and these

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<sup>27</sup> In mature markets this positive correlation between returns on foreign currencies and assets is seen in the case of bonds but not in that of shares (Solnik, 1996).

<sup>28</sup> These effects on prices would probably be greater in a more concentrated industry (see Iglesias, 1999)

instruments may play a more important role as the funds mature and include a more varied range of investment instruments.

The Chilean pension funds have participated actively in the markets of financial derivatives based on interest and exchange rates, and the Mexican Congress has recently approved the use of derivatives on underlying instruments that are allowed in the pension funds' investment portfolio. In both cases, the derivative instruments may be used for risk hedging. An interesting aspect of the participation of the Chilean pension funds in the derivative markets on exchange rates is the fact that, as they have converted a larger proportion of their portfolios into foreign assets, they became an important source of supply of exchange risk hedging for the companies funded by foreign debt. By contrast, in the case of Brazil, the funds are strictly limited with regard to foreign investment and the main source of exchange risk hedging for the business sector is the sovereign State. The Mexican pension funds have still to comply with certain prudential regulations and operational requirements, established by the regulatory body, before they will be able to use derivative instruments, but a recent survey revealed that some may be able to begin using them in the second quarter of 2003, in order to hedge interest rate risks (Cervera and Query, 2003).

The pension fund industry in mature markets is adopting more and more new techniques and products of financial engineering. Bodie (2001) claims convincingly that the apparent consensus regarding the advantages of floor plans –in other words, plans with defined contributions with a guarantee of defined minimum benefits– may be achieved by means of private portfolios, invested mainly in bonds which are index-linked to inflation and in call options on stock exchange indexes - to make the most of the “upside” of the stock markets. Although some North American pension funds, such as TIAA-CREF, have decided not to offer these products because of the high cost of call options in the long term, the use of shorter term options may help to make these products more attractive. In fact, similar products have become popular in some European countries. Meanwhile, the present crisis in the pension fund industry in the mature markets has contributed to the fact that some funds are studying the possibility of including asset classes other than the traditional ones and investing in other funds such as hedge funds (Polyn, April 2003). These funds promise similar returns to those of less volatile shares and constitute an indirect

mechanism for investing in derivative products. The pension funds are also having recourse to the use of structured products, in order to evade in some cases the regulatory limits.

#### 4.4. Performance requirements

Minimum performance requirements reduce the agency risks of the managed funds but also distort portfolio decisions and may produce destabilizing effects on the local capital markets<sup>29</sup>. In some countries the funds are required to achieve certain minimum returns, which are usually calculated by reference to the industry average<sup>30</sup>. The rules relating to results tend to make the funds adopt “herd” behaviour, allocating their assets in a less than optimum way. In a recent study it was shown that, due in part to these performance regulations, the correlation between the returns of the pension funds has been extremely high in Argentina, Chile and Peru, and the results of the funds in these last two countries have been less satisfactory than the simple IFC index of share returns<sup>31</sup>. The smaller funds in particular feel the pressure of not deviating too much from the behaviour of their large competitors, and this herd behaviour in turn can produce destabilizing effects on prices<sup>32</sup>. In order to avoid this herd behaviour, Hungary has adopted wide bands for maximum and minimum returns and Poland has established a longer period (24 months) over which the fund’s return is compared with a reference parameter<sup>33</sup>. More recently, Chile authorized its pension funds to offer multiple funds, in other words, five types of fund with different investment options which can be adapted to the age profile of different members. Mexico authorized two types of funds as from November 2000.

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<sup>29</sup> The destabilizing effects may be more serious in a more concentrated industry; see an exhaustive analysis of consolidation and concentration in the financial sector in emerging markets, including the pension fund industry, in IMF (2001).

<sup>30</sup> These countries include Argentina, Chile, Colombia, El Salvador, Hungary, Peru, Poland and Uruguay. See a general analysis of regulation in Latin America in Yermo (2000). See a more general international study on return guarantees in Turner and Rajnes (2001).

<sup>31</sup> See Srinivas, Whitehouse and Yermo (2000).

<sup>32</sup> The empirical systemic analysis of herd behaviour among pension funds in emerging markets is still insufficient. Queisser (1998) compares the weightings of the portfolios of the Chilean funds: although the average proportion of the portfolios in shares is 29.4%, the standard deviation is only 1.6%. Valdés-Prieto and Ramírez (1999) examine the effect of reducing the fluctuation bands to a figure round about the minimum return in Chile and find that the effect on the degree of herd behaviour is small, but positive.

<sup>33</sup> See Pennacchi (2000)



Nonetheless, some analysts maintain that the concern about this type of regulation may be exaggerated, because it simply accentuates incentives that already existed<sup>34</sup>. They also point out that herd behaviour has been observed in mature markets that do not apply similar restrictions<sup>35</sup>, and that the growing use of investment strategies based on reference indexes on the part of asset managers reinforces the tendency to apply standard investment strategies. Finally, absolute minimum performance requirements<sup>36</sup>, as adopted in some countries, may force the pension funds to invest excessively in securities with very low risk (and low return).

## 5. CONCLUSION

Just as in the mature markets, the assets managed by the pension funds have grown at a rapid pace in the emerging markets that have reformed their pension systems. The growth of these assets has had beneficial effects (quantitatively and qualitatively) on the local capital markets. By contrast with the mature markets, the advantages have been concentrated to a large extent in the bond markets, due to the regulatory restrictions affecting the selection of the pension fund portfolios.

This rapid growth of the assets managed by the pension funds will probably continue in the medium term and the capacity of the domestic securities markets to respond to this increase in demand remains uncertain. The growing gap between supply and demand in local securities markets may cause considerable distortions in share prices and risk concentrations, and aggravate the herding inherent in the behaviour of the institutional investors. In the face of the growing gap, it is imperative to maintain and coordinate efforts to improve the regulatory systems of the pension funds, and likewise those of the securities markets.

Although developments of portfolio theory assign a more important function to bonds –particularly index-linked bonds– the arguments in favour of diversification seem to indicate that shares

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<sup>34</sup> See Vittas (1998)

<sup>35</sup> See Lakonishok, Shleifer and Vishny (1992)

<sup>36</sup> Among the countries that offer absolute guarantees are Hungary and Uruguay. In the same way, the mandatory non-private social security funds in Malaysia and Singapore offer absolute guarantees of minimum returns. See also World Bank (2000).

should continue to form part of optimum portfolios. Since it is probable that the growth of the assets managed by the pension funds will be greater than that of the local stock markets, the pension funds might benefit from a larger allocation in foreign assets. The gradual liberalization of portfolio investment limits for index-linked bonds and foreign shares, perhaps through international, diversified mutual investment funds, will probably improve the regulatory system for the pension funds in some countries. Investments in foreign assets raise the exchange risk of the optimum portfolio, but it is important to point out that exchange risk is also present in a merely local portfolio, with large companies that compete in world markets. It seems likely that a certain degree of exchange hedging will be for the best and that financial derivatives will perform an increasingly important function in the pension funds of those countries that are more advanced with the reform of their pension systems. Finally, it may be necessary in due course to liberalize the limits concerned with results, in order to avoid excessive herding behaviour in an asset management industry which is becoming more concentrated.

The great differences between countries makes it difficult to formulate more concrete recommendations, but it is likely that these general policy measures will be applicable to various countries that are implementing reforms. Nonetheless, it is worth mentioning a few important warnings. First, as may be seen from the Chilean experience, it is a good idea to adopt a gradual approach to improving the regulatory system. However, those countries applying variants of the Chilean model may benefit from earlier experiences and perhaps use a less gradual reform approach. Nonetheless, it would be essential to complement efforts to improve the supervisory capacity of the regulatory bodies and give the asset management industry time to understand the new products and techniques in risk management. Second, liberalization of the foreign investment limits equals liberalization of controls on flows of capital, and the macroeconomic consequences of these measures must be studied in detail. Finally, although this is not a subject that has been dealt with in depth in this document, the fiscal costs of the transition constitute an important risk for the survival of the pension reforms. An underestimation of these fiscal costs may be a source of macroeconomic instability and may reduce the multiple advantages for the capital markets, and others to be gained from pension reform.

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# PENSION FUNDS: PERFORMANCE AND IMPACT OF INVESTMENT REGULATION

MANUEL CARVALLO<sup>1</sup>

## 1. CREATING A VIRTUOUS CIRCLE

The country needs to increase internal saving in order to support growth. The creation of reserves for pensions would produce a virtuous circle, allowing growth in internal saving to be sustained. That was one of the main reasons behind the introduction of this system.

However, there may be factors that contribute to this saving's failure to be converted into growth: uncertainty, speculation and consumption all affect the situation and prevent the virtuous circle from closing.

The characteristics to be desired are as follows: in saving, that it should be continuous, long-term and cumulative; in investment, that it should be diversified, with little correlation and with foreseeable, constant flows, because the development of the capital market occurs as a consequence of a more secure environment; in growth, that it should be sustained and should support infrastructure and the creation of employment.

The virtuous circle receives feedback through regulations which support the credibility of the system, an investment policy which

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<sup>1</sup> Senior Consultant of the firm Watson Wyatt in Atlanta, U.S.A.  
Actuary, graduate of the Universidad Anáhuac, specializing in insurance operations.  
Mr. Carballo has 15 years' experience in pensions and finance, having held positions as consultant actuary in Watson Wyatt Mexico for six years and various responsibilities in banking institutions, such as the Banco del Atlántico, where he was Director of the Retirement Savings System (SAR) and Director of finance and risk management.

allows diversified portfolios to be created with little correlation, and a follow-up mechanism which provides the market with information on flows and the accumulation of capital that generates transparency.

Investment policy will be the main subject of this chapter, because it is from this section of regulation that it is possible to channel growth in an appropriate way. If there is growth in assets, then better pensions can be granted, while regulation, for its part, produces confidence and encourages participation in such growth.

In developing countries, capital is scarcer than labour (there is plenty of labour, it is jobs that are in short supply!), and for that reason yield on capital is higher than growth in wages and long-term capitalization is possible. A funded system helps in the formation of capital and in setting up this virtuous circle.

## **2. LAW OF FINANCING FOR A PENSION FUND**

We are in the business of providing our clients with better ways to live, 20 or 30 years into the future. Today we have to consider the elements that are in our hands to raise the standard of benefits.

The desirable characteristics, as far as benefits are concerned, are:

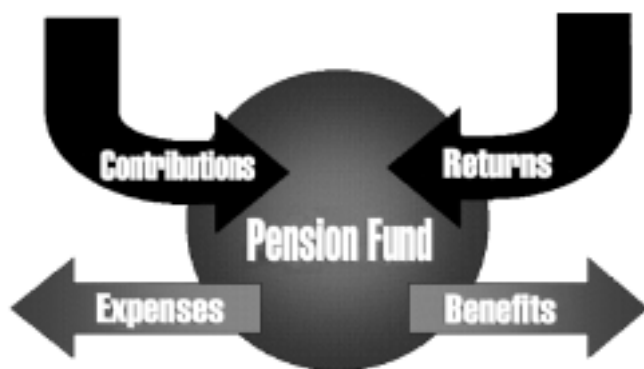
- That they achieve target levels of replacement
- That they are achievable under differing economic scenarios (inflation)
- That they maintain their purchasing power over time

In order to provide benefits with the above characteristics, we need to consider:

**The Design:** This determines the amount and frequency of contributions and establishes a target pension, under certain assumptions. (see Figure N° 1).

**The Hypothesis:** This influences the times at which flows should be carried out. If the assumed rate of return on the assets is not reached, lower benefits will be received. The plan in Mexico has a minimum pension clause which, in the last resort, transfers the risk of the hypotheses not being fulfilled to the government.

**Figure N° 1**  
**FINANCIAL FLOW OF THE PENSION FUND**



$$\text{Benefits} = \text{Contributions} + \text{Financial income} - \text{expenses}$$

As an industry, we want to improve returns, because in that way it will be possible to achieve better benefits (larger or more stable). The main element within our grasp if we are to achieve it is the asset structure.

The asset structure influences the calculation of the income to be received by the fund through interest and appreciation of capital. It is not a short-term solution, because investment in assets with higher return is associated with accepting increased volatility, but it does have a direct influence on the amount of the benefits.

The first step is to study the risk characteristics inherent in the present asset structure, in order to control the volatility of the portfolio as a whole.

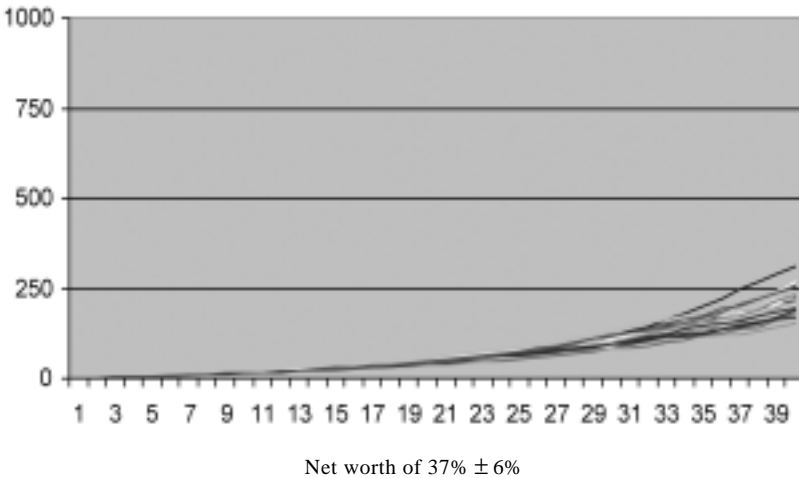
### **3. GROWTH AND RISK**

The interchange between risk and return must be considered in accordance with the degree of risk aversion. A simple structure: 100% investment in fixed income instruments, assuming contributions during thirty years, means that a person will receive an average pension within a range of 31% to 43% of his/her wage (See Figure N° 2).



The merit of this strategy is that it does not create many differences between the clients (the employees or pensioners) because the returns are very close, but there is a real risk that the pension will not achieve the replacement targets (it is insufficient or is lower than the minimum pension). This risk is concentrated in the regulation.

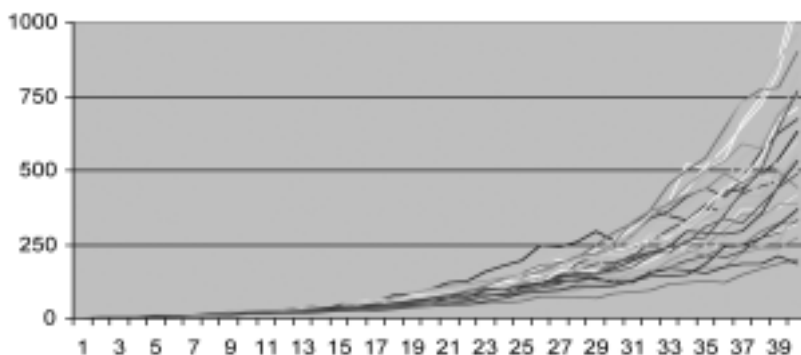
**Figure N° 2**  
**GROWTH AND RISK**  
**SCENARIO OF FIXED INCOME INSTRUMENTS**



Let us assume a scenario in which the investment system is opened up; in this second example, 50% is invested in shares, which produces disparity in members' returns but achieves better pensions as a whole (see Figure N° 3). From the point of view of the system, it reduces the cost to the government associated with minimum pensions, though it requires greater efforts in terms of adequate communication, so that the various members invest in accordance with their risk-taking capacity.

Aversion to risk changes with age, so the objectives of the system are not absolute. There must be a certain flexibility to allow replacement targets to be achieved.

**Figure N° 3**  
**GROWTH AND RISK**  
**SCENARIO WITH MIXED INSTRUMENT PORTFOLIO**



Net worth of  $92\% \pm 40\%$

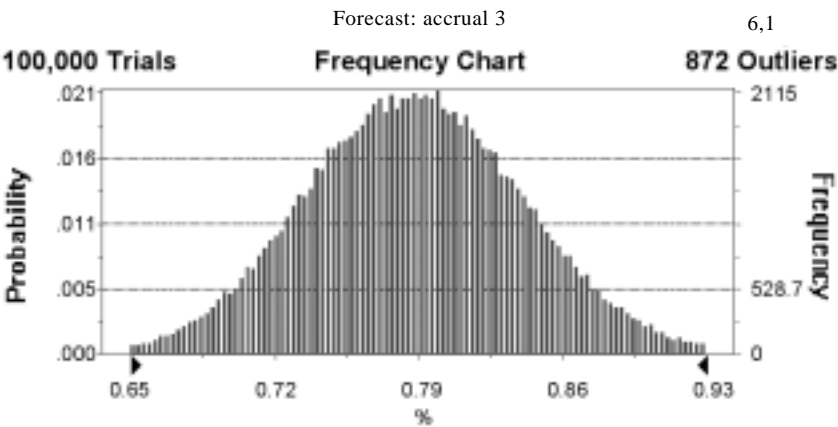
#### 4. EFFECT OF VOLATILITY

If we analyse a portfolio over time, and invest for 10 years in an asset class on the assumption of a certain return and volatility, we shall obtain a average return that is lower than the one assumed, when we make up the return over time.

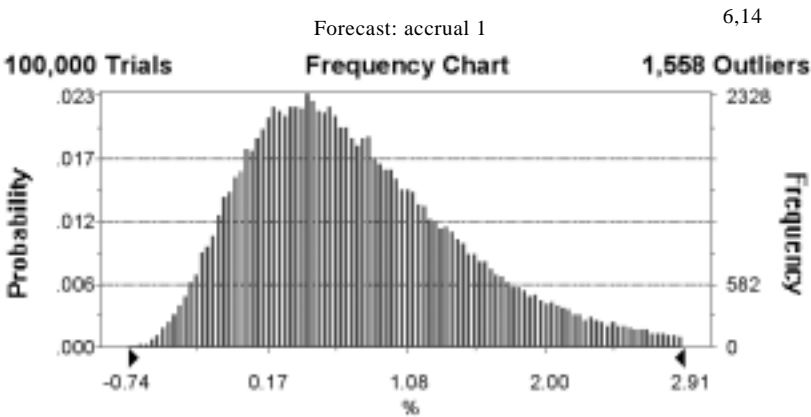
Figure N° 4 makes it possible to observe the compound return achieved over 10 years by an asset class (which might be bonds) whose average return is 6% per year with a standard deviation of 1%. In Figure N° 5 the expected return is the same, 6%, but the standard deviation increases to 14%. The change in the bias observable in the diagram is attributable only to the increase in the volatility of the asset class and reduces the expected long-term return (geometric mean). The bias of the distribution of returns is explained by the fact that potentially assets are more likely to grow than to fall.

Example: If \$1 invested in a share reaches a value of \$2 in the course of one year, the return obtained was 100%, but if the price falls in such a way that it is worth \$1 again at the end of the following year, it has a negative return of 50%. The average return for the two years is 25% and results from adding +100% and -50% and dividing by 2. However, it is clear that the compound return over the two years was 0%. The geometric mean of the return is lower than the arithmetic and the arithmetic mean falls with increased volatility.

**Figure N° 4**  
**RETURN ON ASSETS**  
(STANDARD DEVIATION = 1% )



**Figure N° 5**  
**RETURN ON ASSETS**  
(STANDARD DEVIATION = 14%)



The concentration of the portfolio in a single type of security captures the whole of this effect, hence the need to diversify. The portfolio of government securities produces lower returns over time than those expected, because of the associated volatility.

**Table N° 1**  
**METHOD FOR CALCULATING RETURNS**

	<b>Arithmetic Mean</b>	<b>Standard Deviation</b>	<b>Geometric Mean</b>
<b>Shares</b>			
World	10.2	17.0	9.1
US	9.9	17.3	8.7
Emerging markets	12.7	32.6	8.7
<b>Debt</b>			
US G.I.	4.7	7.2	4.4
International G.I.	5.0	11.0	4.5
Emerging markets	6.0	14.0	5.2

In the case of portfolios which saturate the investments of one asset class, the return on the system is equal to the average of returns. The fact of adding value to the portfolio becomes a game which adds up to zero, because what some funds win, others lose. If the universe of securities for investment is in the hands of those participating in the industry, then what the industry obtains is the average return.

For highly regulated systems, the return on the system becomes very similar to the rate of issue of those securities in which investment is allowed, with the result that whoever decides the investment system also decides the level of the rate and consequently the replacement level of future pensions too.

## 5. DIVERSIFICATION

Asset classes are grouped by their risk level, from the money market to international shares, passing through segmentations of investment bias and capitalization value.

In order to achieve greater return, greater risks have to be run. Pre-mixed funds allow investment alternatives with profiles that seek to attract different investors depending on their age, their ability to take risk and their propensity or aversion to such risk.

In this type of fund it is important to guard against the fund's changing its promised investment strategy in its sales efforts,

with the aim of becoming a better option for those in search of fashions. An example of this in USA was the increase of technology shares in the funds between about 1997 and 2000, in response to the fashion for this type of security. Some of these funds marketed this departure from the investment policy in order to attract a larger number of investors, in exchange for a higher risk of concentration per type of issuer, and certainly modified their initial investment prospectuses.

The pre-mixed funds may base their stipulations on risk level or on a time horizon.

The funds structured on the basis of risk usually have names such as “aggressive” or “conservative” and the share investment content depends on the profile of the fund. Funds structured on the basis of a time horizon have names like “fund 2030”, suggesting that it is an appropriate alternative for people who are thinking of retiring at a date round about 2030. In these cases, the fund-management company is responsible for gradually reducing the risk profile of the funds by changing the asset structure over time.

## **6. CHALLENGES FOR THE INDUSTRY**

The main challenge for the industry is to become a responsible interlocutor of the regulators by defending the business of providing adequate pensions in the future and not merely concerning itself with managing accounts in the present. It should therefore study the impact of the different asset structures on the return and risk of the portfolios and understand the various elements that affect levels of replacement.

It is important that the industry understands the relation between the various elements affecting risk in the portfolios, in order to be able to make comprehensive proposals to the regulators. Demographics: retiring age will surely be lower in many of our countries because the duration of the working career is becoming shorter, especially in jobs involving labour, due to the inability to generate sufficient sources of employment. The participation of women in working careers is becoming more frequent every day, changing the demographic structure of the work force. The informal economy also affects the demographic structure of the members of the system. In cases like that of Mexico,

demographics will be seriously affected by the migration policies of our northern neighbour.

With regard to wages, the increased supply, as far as formal jobs are concerned, may keep real wages at the same level and in this way the pressure on the return of the assets may be eased. The valuation assumptions, meanwhile, estimate the times of the flows and although these do not affect the cost, because this is known when the pensions are paid, it may be a determining factor in obtaining the desired level of replacement.

The greatest risk that we are facing has to do with the reinvestment of the assets, because there is a substantial difference between the periods in which the retirement pensions will be obtained and the average duration of the financial assets. The risk of reinvestment consists in the possibility of renewing the investment of the portfolio at a lower rate a few years later, and of this being insufficient to provide adequate investments.

The industry should propose the investment policy and portfolios to be used, as also the benchmarks against which the performance of the investment managers can be measured.

The case of the *benchmarks* would provide material for a whole session, so I will refer you to the article, “Benchmarks for the new millennium” by Howard Crane, published by AIMR. For this presentation, suffice it to say that a benchmark is an investment portfolio which represents the risk and return characteristics of one asset class.

## **7. CHALLENGE FOR THE REGULATORS**

Undoubtedly, the challenge for the regulators consists in reducing the fiscal cost of the system, reducing the present value of the minimum pensions which will have to be provided in the future and the differentials against the IMSS pensions for those who are under the transitional scheme.

The investment targets should be carefully established, with varying lengths of term. A stable short-term system (with little volatility) may have a negative effect on the replacement levels of pensions in the future.

The aim should be to decrease the present value of the fiscal cost, but.....at the same time to safeguard the amount of minimum pension at any of the terms, because otherwise confidence in the system will be put at risk.

The management of the fiscal cost presents a dilemma: paying lower rates of return today (a certain event) allows more leeway in the use of fiscal resources, with the risk of a greater fiscal cost (a probable event) in the future, when minimum pensions have to be covered.

Opening up the investment system allows diversity of investments, but no commitment to any one of them in particular should be required. The administrators should be able to take decisions according to the conditions of the markets, the risk of the portfolios on offer and the risk profile of their clients.

The regulators must establish a follow-up system with regard to the targets of wage replacement for those taking part in the system, and in accordance with the structures of liabilities. In this way “pack behaviour” among those participating in the system will be avoided, because it will be possible to measure each fund against the established investment structure. The evaluation of the administrators is carried out on the basis of the tracking error (the follow-up or search error), which makes it possible to see the level of risk, compared with the chosen benchmark.

## **8. RISKS OF THE SYSTEM**

It is very important that regulators and industry agree on the strategies to be pursued in the future. One element which may help them is to achieve a jointly defined risk budget. In other words, they should establish a measure in pesos of the financial resources that are permitted to go in search of higher yield (accepting a greater risk), without endangering replacement levels and the aims of the system.

In order to establish the risk budget, they should first establish the current situation, consistent with the diagnosis of strategic challenges, and obtain an actuarial valuation for the existing scheme.

When setting investment targets, it is important to consider avoiding the payment of minimum pensions and providing

replacement levels according to the ages of members and the number of years for which they have paid contributions.

The characteristic of the minimum pension means that the plan becomes a defined benefit plan for a sector of employees likely to receive that pension.

In order to construct the scenarios properly, the assets and liabilities of the system have to be considered in a coordinated manner. The construction of models of assets and liabilities makes it possible to foresee the consequences that investment decisions taken today will have in the future. The ranges and probability levels of the future impact of the mix of assets in relation to the liabilities of the system are known. A model of assets and liabilities makes sense for the system as a whole, but not for individual portfolios.

A volatile investment may be appropriate for a worker who has recently entered the system, but that same level of volatility may be unacceptable for people nearing retirement. Risks must be evaluated on the basis of the distribution of replacement levels.

## **9. BUDGETING THE RISK**

Budgeting the risk for the system requires a benchmark that is linked to liabilities. The follow-up must be at two levels: on the one hand, at the level of the system, safeguarding the structure of liabilities and replacements and at the second level, safeguarding the returns of each investment portfolio, because the average yield of the various portfolios must fulfil the aims of the system.

Once a decision has been taken regarding the risk budget or total amount in pesos of risk for the system (remembering the importance of defining the time horizon), the origin of the risk has to be defined, generally in two classes; either by structural decisions or introduction decisions.

Structural decisions define the mix of assets and the benchmarks that are selected; introduction decisions define the tracking error level of the portfolio compared with the benchmark, plus whether the management of the portfolio will be active or passive and the added value level that it hopes to achieve.



The manager of a portfolio assigns the risk in pesos to different areas of investment opportunity and to do that, he takes his corporate governance capacity and investment targets into account and structures a portfolio on the basis of deviations from the portfolio defined for the system.

The risk budget for each administrator is established in relation to the asset class defined through the benchmark. Each administrator must specify the following when presenting its product to the regulators:

- The level of risk, on the basis of the tracking error compared with the benchmark
- The target return in excess of the benchmark
- Net Information Ratio (excess return/tracking error) as a measure of efficiency

The main focus of each portfolio administrator must be to maximize return adjusted by risk (Net Information Ratio).

## **10. CHALLENGES IN CONSTRUCTING THE INVESTMENT POLICY**

The aims of investment are difficult to define and sometimes present an open conflict between generations of employees. For the conciliation of objectives, a dialogue between industry and regulators is imperative, because in all cases they must provide pensions which allow adequate levels of replacement.

The investment policy must therefore be “de-regulated”, because it should always be possible to create investment portfolios or funds that meet the needs of various segments of employees with irreconcilable preferences as far as risk and return are concerned.

It has to be recognised that the financial objectives of the fund are difficult to define and establish, just because they cater for a wide variety of persons and interests. The selection of time horizons represents a difficult problem of corporate governance, because the interchange of risk and return cannot be taken on the basis of majorities, and even less on the average, since every member has unique priorities.

It is important that the regulation of the system be as open as possible, so that it allows the asset mix to evolve from time to time and its component parts to rearrange themselves. It makes sense to regulate the existence of adequate processes for taking decisions concerning investment, risk control, corporate governance, etc, as means of safeguarding the employees' net worth, but not to establish model industry portfolios.

The result should be regulation that opens up investment policy and allows different asset structures to be built, in an industry that competes responsibly on the basis of "budgeted" risk.

## 11. CONCLUDING IDEAS

The processes of asset structure require adjustments from time to time, so it is important to encourage regulations which allow for change without the necessity of changing the laws, and which do not turn into straitjackets.

The pressure to modify asset structure arises from the development of capital markets, where the expected return of an asset class changes according to market cycles. For example, the prize for share-related risk depends on the volatility and rate of the bonds of the country against which they are compared, and therefore the long-term expectation changes as countries manage to decrease their risk and the cost of their financing. The changes that we have seen in Mexico with regard to sovereign bonds affect the long-term expectations of the investor in the capital market.

Another very important change in the process of structuring assets has to do with the changes in the composition of the work force. We have already looked at the possible demographic changes and their impact.

The process of modelling the probable behaviour of asset and liability structures is a periodic prospective exercise and therefore the result suggests small changes in each part of the process. The investment policy must make it possible to implement these small adjustments.

It is possible to model alternative structures and anticipate their quantitative results, but it must be borne in mind that a lot of common sense is needed in this whole modelling process if the programmes are to be able to add value in the future, because that is not only a matter of numbers.

# COMMENTS

ISAAC VOLIN BOLOK<sup>1</sup>

## 1. WHY IS THE INVESTMENT SYSTEM NECESSARY?

For the vast majority, or a very high percentage of the members of the Mexican pension system, the resources in their individual pension account are probably their only financial asset and those savings are perhaps the largest asset they will manage to accumulate in the whole of their lifetime.

In the second place, the subject of pensions is a socially sensitive one and in the third place, unfortunately, the countries in which these systems have been introduced –basically Latin America and Eastern Europe– have one characteristic in common, which is the lack or scarcity of long-term financial savings. As these systems produce a considerable quantity of financial savings, it is important to avoid taking excessive risks or at least, initially, to regulate that excessive risk-taking in a recently emerging industry.

## 2. PHILOSOPHICAL MODEL OF THE INVESTMENT SYSTEM

When speaking about investment policy, a clear distinction must be made between the defined contribution pension scheme and that with a defined benefit, because each of them has implications. In

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<sup>1</sup> Vice-President of Planning in the National Commission of the Retirement Savings System (CONSAR) of Mexico.

He graduated in Administration from the ITAM and obtained a Master's in Administration with special mention in Finance from the University of Michigan, both degrees with Honorable Mention.

He has worked in the financial sector in posts such as Director General of Analysis and Director General of Supervisory Methodology for the National Banking and Securities Commission (CNBV).

the defined benefit system there is a liability, which is the pension promised by the plan. The yield is therefore the bridge which takes us from the contributions to the benefit concerned. That bridge must have exact definitions, such as the asset mix that it should have in order to travel from that amount of contribution to the defined benefit, provided the assumptions are fulfilled within certain ranges.

By contrast, in the defined contribution scheme there are no liabilities apart from the guaranteed minimum pension, so there is no need to match assets and liabilities, from the regulatory point of view at least, nor to be deterministic as regards the target yield and the asset mix needed to produce that target element.

In any case, since the guaranteed minimum pension is a fixed amount, which in our system is equivalent to a minimum wage index-linked to inflation, the yield required would vary according to the wage level. There is therefore no perfect policy within the same fund, where there are workers with different wages. Consequently, the investment system has to be the result of the best possible mix, depending on the characteristics of the members of the fund.

This does not mean that we do not establish a target replacement rate. This rate is based on contributions, commissions and yields. We must work on these three elements if we wish to improve pensions.

The simple distinction between defined benefit and defined contribution implies a very different philosophical model of regulation. We visualise the investment system as a “playing field” on which the administrators move and take decisions in the best interests of their members.

In Mexico’s case, we have administrators with members whose average wages are 2.5 times the minimum wage and administrators with an average of 5 times the minimum wage. We therefore believe that each administrator must take decisions regarding its specific investment policy, in accordance with the characteristics of its members. This is what is known as fiduciary responsibility and the administrators must be very aware of it.

Therefore, from the regulatory point of view, the investment system must be prudent, but broad enough to allow the

administrators to do their job, to take the best decisions on behalf of their members and to select the asset mix which enables them to fulfil their objectives.

Some concepts that apply in the defined benefit scheme are also applicable to the defined contribution scheme, meaning that many people are in favour of establishing a regulatory benchmark. We do not share this idea, because we believe it to be thoroughly inappropriate. It limits the action of the administrators by considering that all the members in all the administrators are the same. It also makes the competition less fierce in the area of yields.

Another bad practice in our opinion has to do with guaranteed yields. Fortunately this does not apply to Mexico, but it does to many of the countries where there are defined contribution systems. The main point is that guaranteed yields have the effect of reducing the intensity of competition between administrators. What is more, the workers end up paying in one way or another for the guarantees offered in terms of yield, either through higher commissions, if setting up a fund to restore yield inside the administrators is not allowed, or through lower yields, because of the need to buy some derivative instrument or insurance to guarantee the yield floor required by the regulations.

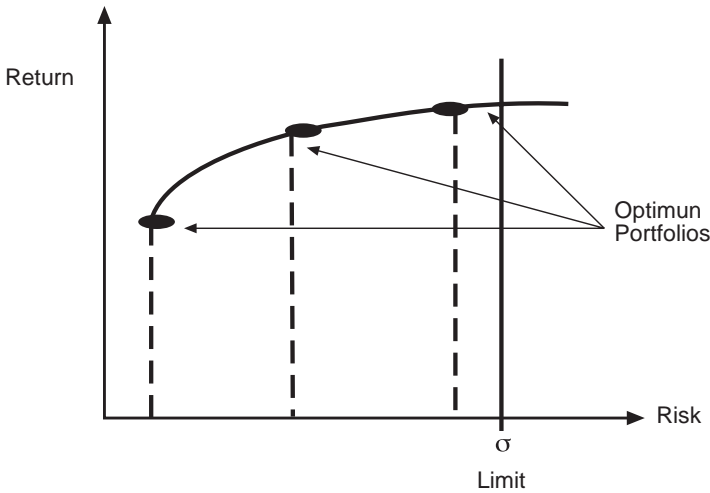
It is for this reason that we consider the combination of the fiduciary responsibility of each administrator, the competition between administrators and a broad system of investment with general market and credit risk limits, not limits by type of issuer or term, to be the best formula for improving expected yields in our systems.

On the other hand, those who should indeed establish a benchmark are the administrators themselves. The benchmark for each administrator should be a point on the efficient investment curve (see Figure 1). It is essential that they remember their fiduciary responsibilities and take into account the level of yield that they are seeking for their members, given the characteristics of those workers and, consequently, the risk that they consider to be appropriate.

### **3. RECENT CHANGES IN THE INVESTMENT SYSTEM**

In the past two years the Consar has tried to broaden the administrators' field of action by eliminating restrictions which do

**Figure N° 1**  
**OPTIMUM PORTFOLIOS OF THE ADMINISTRATORS**



not contribute towards diversification (see Table 1). Some limits made sense in the early days of the system because of the economic and political circumstances of the moment. However, as the system has advanced and become consolidated, these limits have tended to become obsolete and to prevent an appropriate diversification of the pension fund portfolios.

The first restriction that we have eliminated is that concerning the type of issuer. The regulation began with a 65% minimum of government paper, which implied a maximum limit of 35% for investment in private paper. Moreover, only private paper and government paper were allowed. Now the Afores may acquire government, private, state, municipal and para-state paper, and the limits for each of these are based on their credit rating.

In terms of credit rating we used to have an investment system in which only securities with AAA and AA credit rating on the local scale were allowed. Now we have relaxed the regulation to allow investment in A securities. This is important because it allows more diversity as regards the non-government issuers which may be available for Afores investment.

Currencies are a very important element of diversification. According to some studies, currency rates are the final barrier to diversification, given the low correlation between the currencies and the different variables that determine the price of the instruments which make up the pension fund portfolios today. Formerly we were only allowed to invest in government paper quoted in dollars, whereas now the investment system foresees the possibility of government and private paper quoted in dollars, yen and euros.

As regards the type of operations, formerly only cash operations were allowed, whereas now we already allow operation with derivatives in our investment system, though this has not yet been used in the Afores. We believe that the Afores should operate in whole markets, regardless of the asset classes concerned, and for all the asset classes that an investment system allows. This means that the Afores would be able to arrange operations of all possible types, whether in cash or using derivatives.

Operations with derivatives will give the Afores additional flexibility in handling the portfolios, which is very important because it will allow them to make a better job of diversification.

As far as market risk is concerned, the investment system has passed through three stages. The first stage in which 65% of the portfolio had to be made up of debt securities that matured or changed their coupon rate within a maximum period of 182 days. We consider, in the light of the changes that have taken place in the Mexican financial market, that this was an inefficient method of regulating. It possibly made a lot of sense five or six years ago, when the longest-term fixed-rate bond that we had available was for one year (the one-year CETE). These conditions have changed, and today there are bonds for up to ten years at fixed rate, and up to thirty years at real fixed rate. Consequently we made a transitory change in the investment system using a simplified measurement of duration called Average Weighted Term. This was replaced at the end of last year by a Value at Risk evaluation (VaR) which has given very good results. We believe that this measure provides the administrators with adequate incentives to handle volatility.

Once the opportunities have been exhausted for improving expected returns by eliminating these quantitative restrictions –felt

**Table N° 1**  
**RESTRICTIONS THAT HAVE BEEN SLACKENED OR ELIMINATED**

Restriction	Formerly	Now
Type of issuer	Minimum 65% government stock	Limits based on credit rating
Creditworthiness	AAA and AA	AAA, AA and A
Currencies	Dollars only in government stock	Dollars, yen and euros in government and private stock
Type pf operation	Cash	Cash and derivatives based on permitted underlying stock
Market risk	Average Weighted Term	VaR

by some people to be draconian—, other asset classes can be considered, provided that they fulfil certain conditions. These conditions centre on three aspects:

1. The skills and experience of those handling the funds with regard to the investment of the resources.
2. The institutional infrastructure for managing investments and risks inside the administrators.
3. The development of the domestic financial markets.

**3.1. Skills and experience of fund managers**

When investment in more volatile instruments is allowed, it must also be accompanied by increased skill on the part of the administrators in handling this greater volatility.

**3.2. Institutional infrastructure**

The institutional infrastructure refers to organizational culture and the fulfilment of practical measures in the area of integral risk management. Our guidelines imply that the following must be in place:



- An Investment Committee, responsible for establishing strategy in investment matters.
- An independent Risk Committee that fixes internal limits and policies. The aim of this is to provide a counterbalance within the organization itself between the decisions to invest, in order to achieve better yield and weight them by the volatility involved in such decisions, according to the asset classes and terms that are allowed.
- A Comprehensive Risk Management Unit with weight in the organization. This is the unit that carries out the day-to-day work related with risks and provides the Risk Committee with material so that it can take decisions.
- Strict compliance with the processes, policies and procedures established by the administrators' investment and risk committees and published in the manuals.
- Compliance with minimum standards as regards investments and operational risk. The Afores comply satisfactorily with all the guidelines that we have worked with over the past two years and are on a par in some cases with the best international practices. The aim is to make the best use of the investment system and achieve good diversification.

### **3.3. Development of the domestic financial markets**

We, as regulators, are aware of the fact that we must free up the investment system, but we have to do this in parallel with the development of the markets. Freeing up the investment system far beyond the capacity of the domestic markets does not provide increased value, because the instruments needed to do the job of diversification simply do not exist.

Today, the Afores can, theoretically, already have 100% of their portfolio invested in private paper. However, if they were to acquire every single one of the non-government papers, including private securities and those issued by states, municipal authorities and para-state companies in the domestic market, all that mass of bonds would still only account for 40% of the Afores portfolio. This shows how regulation must go hand-in-hand with the development of the financial markets.

There must be a minimum range of instruments and asset classes in order to produce good portfolio diversification. However ample the investment system may be, if the instruments do not exist, the efforts will be useless.

Neither is it enough that these instruments exist; they must also have a minimum level of liquidity so that if the administrators decide to restructure the portfolios, they can do so.

Finally, we believe that it is necessary to have enough participants –investors and intermediaries– for adequate price formation.

If these conditions do not exist, it is difficult to make progress. However, we believe that both the part of the organizational structure concerned with managing investments and risks and the development of the markets are converging towards a desirable level, which will benefit the workers by increasing yield.

#### **4. AGENDA OF THE INVESTMENT SYSTEM**

In the medium term we intend to create a family of Siefors, normally known in the region as multifunds, to allow workers to choose between different investment options, according to their own characteristics and their objectives in terms of yield.

Last year the Mexican Congress approved the possibility of investing up to 20% of the pension fund portfolios in foreign securities. The aim of this is to achieve better diversification and to be able purchase securities which have a low correlation with instruments issued inside the country.

This will become feasible as from 2004, because of the terms of the law and the decision of the united committees, which states that the Consar should take at least twelve months to study the subject. We believe that in the best possible scenario this subject will need to be explored and will be scrutinised by the government bodies in the Consar until next year. The fact that the matter becomes feasible in 2004 does not guarantee that a decision will be taken on it in 2004 exactly; it may come some time later. We consider these changes to be very positive, because of what they may mean in the matter of diversification.

Other objectives of the Consar are to eliminate limits by sector, to allow the Siefors additional yield by lending their securities (securities loan) and gradually to allow the operation of credit derivatives to hedge current risks or take up positions.

# WHAT THE REFORMS HAVE ALREADY ACHIEVED AND WHAT STILL REMAINS TO BE DONE: THE VIEWS OF THE INDUSTRY

GUILLERMO ARTHUR<sup>1</sup>

The comprehensive papers presented have shown the strength of our social security system, both from the point of view of the high rates of return it has achieved, which bode well for future pensions, and from that of the contribution that these have made to the economic development of our countries.

This saves me recounting what has already been achieved, allowing me to refer simply to what has been stated in other documents in this book.

These remarks will concentrate on the challenges that we must face in order to enhance the contribution that the private social security system can make towards improving pensions on the one hand and developing the economies of the countries on the other. This contribution depends, undoubtedly, on the quality of regulations and the size of the capitalization system, which in some cases co-exists with pay-as-you-go systems. Various challenges stem from there which could be mentioned for the future, and which refer to changes in regulations that would ostensibly improve the performance achieved by this system so far.

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<sup>1</sup> President of the International Federation of Pension Fund Administrators, FIAP, and formerly Minister of Labour and Social Security, Mr Arthur has a law degree from the Pontificia Universidad Católica de Chile.

Currently he is President of the Chilean AFPs Association, Vice-President of AFP Summa Bansander S.A., and President of the Federation of Private Social Security Institutions.

He is also a member of the Administrative Council of the International Labour Organization (ILO), the Executive Council of the International Employers' Organization (IEO) and the Labour Committee of the Confederation of Production and Trade.

Author of the book "Legal System of the New Pension Systems", Editorial Jurídica de Chile 1999.

The first challenge should be called “the political challenge to the system”. The weak position of public finance in some countries in the region is having a negative impact on the new pension systems. In particular, decisions are being taken with regard to the size of the capitalization systems and the regulation of investments with the sole aim of solving fiscal cash deficit problems and without necessarily thinking of the best way to reinforce the capitalization systems.

Manipulating the regulations of the pension system in order to obtain resources to help finance the fiscal cash deficit is bad policy. The creation of the capitalization system which replaced the pay-as-you-go systems meant halting the growth of public debt which was implicit in the old pension systems and it will therefore have positive long-term effects on the fiscal situation.

As a result, any change in regulations which weakens the capitalization systems will produce negative effects on public debt in the long term. The challenge, therefore, is to convince authorities, legislators and regulators of the inadvisability of restricting the pension system to suit short-term fiscal needs, without considering the economic advantages associated with the existence of solid, efficiently regulated capitalization systems.

The second challenge refers to the rate of return. It is clear that the return on the investments of the capitalization system has been far greater than the performance of the returns in the pay-as-you-go systems and this has been confirmed by various experts. The evidence given by Robert Palacios serves to prove that the results of the reformed systems in Latin America confirm these expectations. The rates of return of the pension funds are much higher than growth in wages. However, it is also true that in many countries the rates of return on the funds have tended to fall during the past two years compared with previous years, a situation that can be explained for a number of reasons. The first of these reasons is the deceleration of the world economy plus domestic economic problems, but investment regulations which do not allow adequate diversification of portfolios have also influenced this situation and, occasionally, the narrowness of local capital markets.

On the other hand, the practice of the new systems has also made it clear that different members require different types of investment portfolios and that there is no one portfolio

composition which is best for everyone. There is therefore a double challenge to be faced, that of ensuring long-term rates of return that allow the new systems to fulfil their promises and that of progressing towards a wider variety of portfolios. With this aim in view, the first thing is to fine-tune investment regulations and advance towards more diversified portfolios, with more investment in equities, less investment in government securities and more overseas investment.

It is vital to reaffirm the fact that investment policies must have the security and yield of the investments as their sole, exclusive purpose. They cannot be used as a mechanism for financing fiscal deficits, as has happened in some associated countries, or for other needs apart from those corresponding to the social security system.

Therefore the great challenge is to tackle the task of achieving sufficiently diversified regulation, and this will occur as we broaden our investment margins abroad.

Together with the above, and thinking of the great age differences among members, the other challenge is simply that of being able to offer them different investment portfolios, with different risk/return combinations.

Perhaps no investment is, by definition, as long-term as the investment of social security systems. For this reason it would seem important for there to be portfolios with periods of 20, 30 and even 40 years in mind. This encourages a movement towards advances on legislation and regulation of multiple funds, or multifunds, as some countries –Chile, Peru and Mexico– are already doing.

The other important challenge is that of the pensions themselves. Up to now, the main effort has been directed to active members because the system is young, but the countries where the system is arriving at a stage of greater maturity are facing an increasingly large percentage of pensioners. Basically, the system envisages two mechanisms for them: programmed withdrawal, in which the worker withdraws the funds that he/she has saved, on the basis of a programme, but assumes a double risk: the risk of longevity where his/her funds may run out, leaving him/her with nothing but the state guarantees and also, the risk of the interest rate or of the return on the portfolio.

For this reason there is the other option, the life annuity, in which the worker transfers the aforementioned risks –longevity and yield– to an insurance company.

However, that solution is not entirely fair, because the life annuity that covers these risks for the worker is much more expensive for people with less money, who are proven to have far lower life-expectancies. There is therefore another challenge to be faced here: that of finding new pension combinations, new alternatives, which make it possible to avoid these risks without charging a higher price for them in those sectors with lower incomes which expect their pensions not to deteriorate.

The other challenge that is always present for a social security system is that of coverage. There is no doubt that coverage cannot be understood to be a responsibility of the social security system itself, but is rather the result of the defects or virtues of the labour market in each of the countries.

What is more, there is considerable evidence, as offered by Robert Palacios and Klaus Schmidt-Hebbel, that individual capitalization systems contribute to improving coverage by putting benefits on a level with contributions, because the worker feels that his/her contribution is equal to the present value of what he/she expects to receive in the future.

Facing the challenge of extending the coverage of the new pension systems requires certain measures, such as including groups in these systems that were originally excluded, e.g. the public and municipal workers in Mexico; getting rid of competition between public and private systems such as exists in various countries in the region, because it has been demonstrated that capitalization systems contribute far more to improving coverage than pay-as-you-go systems, and eliminating all those disincentives for incorporating self-employed workers into the new pension system.

To conclude, one challenge remains, and that is to promote an authentic social security culture. A central feature of these systems under analysis is that they are based on freedom. The worker is free to choose the firm to manage his/her funds. He/she is free to choose the amount of the deposit he/she is going to make, over and above the mandatory contribution, free to decide the age at which he/she wishes to retire, free, with the multifunds, to choose the

portfolio that is most appropriate to his/her personal interests and position. The exercise of all this freedom, for people who are not always well-informed, makes it necessary to accentuate the role of the advisors of the workers, so that every decision that they take is the most suitable one.

With good advice, workers are going to become aware that they are involved in a daily process of building their pension for the future. At the same time they will realise that they are the sole owners of the capital that has been saved and in the end this sense of fund ownership will be the best defence for the pension systems against the interventions that governments may want to make in order to cover other needs apart from those of social security.

It is therefore sufficient to refer to what has been written in other documents as far as achievements are concerned and as regards challenges, the subjects of coverage, yield and pensions have been mentioned. However, the final accent should be placed on the fact that when a social security culture has been achieved which gives workers the feeling that the funds are their own, then the system will be on a really firm footing, absolutely rock-solid and safe from the interventions that many countries in the region have had to suffer so far.

# WHAT THE REFORMS HAVE ALREADY ACHIEVED AND WHAT STILL REMAINS TO BE DONE: THE VIEWS OF THE REGULATORS

ALEJANDRO FERREIRO<sup>1</sup>

This presentation will concentrate on running very quickly through what has already been achieved, the assets, the items on the credit side of the pension system in Latin America, and will then pass on to what is pending, the challenges, to what is on the agenda in the way of changes which need to be tackled.

## 1. ACHIEVEMENTS IN THE ECONOMY AND IN PENSIONS

With regard to achievements, the first thing to be underlined is undoubtedly the large accumulation of resources which, in the extreme case of Chile, amounts to 56% of the gross domestic product. This, with an appropriate legal investment system and scrupulous exercise of the fiduciary responsibility of the pension funds, means that financial resources can be channelled efficiently into productive activity and so stimulate the development of the country.

This amount of accumulated resources also gives the countries a certain financial autonomy, making it possible for them to lower their level of risk at the same time and giving them favourable

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<sup>1</sup> Superintendent of Securities and Insurance in Chile. A lawyer, with a Licentiate in Legal and Social Sciences from the Universidad de Chile and Master of Arts from the University of Notre Dame, Institute of International Peace Studies, Department of Government and International Relations.

In May 2003 Mr Ferreiro left the position of Superintendent of Pension Fund Administrators, which he had held for almost three years.

He is Chairman of the Risk-Rating Commission and a member of the Presidential Advisory Committee for the Protection of the Rights of the Individual.

He was formerly Superintendent of Social Security Health Institutions (Isapres).

He lectures at the Universidad Andrés Bello and the Universidad de Chile and is a consultant on regulation of health insurance for the World Bank, DFID, the Panamerican Health Organization (OPS) and other institutions.



access to international public and private debt markets, at low costs. If one adds to the above the competition that the capital market represents for the banking sector, by offering a variety of sophisticated financial de-intermediation instruments for the AFPs to invest in, the benefit becomes clear in terms of more, and more efficient, funding to stimulate economic development.

The second subject is yield. So far, the yield on the pension funds in Latin America has undoubtedly been exceptionally good, far higher than the target estimated for calculating the rate of return to target replacement rate parameters. But it is also true that a reduction in rates of return is to be expected in the short term, particularly for those more mature economies where the capital gains or structural effects of the transition are becoming less significant. And it is precisely this natural reduction in rates of yield which explains the need to be constantly improving and fine-tuning the investment system, making it more flexible in order to maximize the returns on which people's future pensions will depend.

In the third place, there is an improvement in the quality of the social security service. It is certain that competition for members creates a stimulus to provide an adequate service which is infinitely superior to that offered by the old public and pay-as-you-go systems to the person queuing to receive a social security service or to obtain information about it.

Another aspect worth looking at in some detail is that which refers to the development of the associated markets, because the regulation of investment in the new systems has encouraged not only the development of the capital market but also the insurance industry and the financing of alternatives.

There has been efficient allocation of savings and investment resources, greater possibilities of financing large investment projects; financial de-intermediation, new financial instruments developed in the hope of possibly being offered to this huge institutional investor which the pension funds have become; the development of a risk-rating industry, which is definitely necessary in order to be able to classify the risk of debt instruments, fundamentally, and thus ensure that the resources of the pension funds can be invested safely and with adequate information; securities custody systems, improvement of securities intermediation on the stock exchanges, etc.

The impact on insurance deserves special mention, because the phases of social security accumulation in which the AFPs participate lead necessarily to phases of social security drawdown, where the product of choice is the life annuity offered by the life insurance companies. There is growing competition in this market with significant increases in the volumes of resources administered by the sector and this may in the long term result in a problem which is observable in the management of the funds, namely concentration. If there are important degrees, and possibly risks, of concentration in investment management in the active phase, when the total volume of social security resources is focused increasingly on the passive phase in which the life insurance companies are involved, there is increased competition in the allocation of social security resources.

The AFP System has also produced investment in productive sectors, such as the housing market. Klaus Schmidt-Hebbel gave a quantitative analysis of the impact of the rise of the pension systems on growth. One might possibly ask oneself whether there is capacity to reflect the impact of the rise of a system of long-term funding qualitatively in such figures, one which has allowed about 15% of the Chilean pension fund assets to be invested in mortgage instruments, especially in mortgage-backed securities. Finally, it is the pension funds that are financing house purchase for people who would otherwise have no access to it, at rates which are at levels today of 5.5% per annum in real terms. Indirect encouragement is being given to a highly dynamic sector, namely construction, employment, and therefore also growth. This takes place directly through mortgage-backed securities and also indirectly, in smaller quantities in Chile's case, both through the share units of investment funds whose underlying assets are related with the real estate market and through securitized mortgage bonds.

In infrastructure, the pension funds appear as fundamental actors in the possibility of financing large investment projects. In Chile, however, the financing of infrastructure concessions to private companies done through the pension funds is still proportionately quite low. This would appear to be due not so much to regulatory barriers as to the fact that some banks which finance these projects offer funding at lower rates than those demanded by the pension funds. Anyway, it is obvious that resources for funding large infrastructure projects are available and it is legitimate to hope for

an increase in this direction. A little more may be shown from the investment in share units of real estate investment funds. It is therefore possible, and satisfying, to see a significant impact on a real, highly dynamic sector of the economy such as construction, housing and infrastructure.

With regard to the impact on the labour market, Klaus Schmidt-Hebbel has already stated in figures what was originally written in prose. That apart, it is interesting to mention an anecdote: on one occasion, in conversation with some people concerned in the health reform that the Clinton administration tried to introduce in the USA, they said that the attempt was made because of cars... They realised that one of the main components in the cost of North American automobile production was health insurance, almost more than iron, and more than technology. To pay an average of 14% in health insurance for the workers in the automobile industry was untenable, because in the tradable sector of the economy, social security costs which are particularly high and are much greater than those faced by competitors, end up by affecting the country's overall ability to compete.

In Chile, certainly, paying 26% in pension contributions, as happened in 1980, is not the same as paying 12.5%, as happens today, and competing in the tradable sector with countries which are contributing rates equivalent to 12% is not the same as doing so with countries where rates are much higher. There is therefore an impact here which affects employment, derived fundamentally from the lower contribution rate.

It has also been possible in second generation reforms to broaden the range of investment alternatives. The multifunds –which have already been explained– aim to increase the expected value of pensions and allow each person to find the combination which best suits his/her needs and preferences, within what social security has to offer.

This is going to produce a series of positive effects, and at the same time, an additional challenge for the regulators: the performance of the pension funds has generally been measured on the basis of return, but here people are being told: ladies and gentlemen, the important point is to compare risk and return, because these two aspects are the elements of the new investment alternatives, the two sides of the coin. Everyone knows how to measure return, and people have assimilated that as part of their culture. But they do not

know how to measure risk –though the financial experts do– and people do not have this concept assimilated into their culture. If multifunds are offered which give comparisons based simply on yield without including the risk aspect, incomplete competition is being generated with regard to the information available to the member as he/she discriminates and decides.

In the multifunds there are different risk/return combinations, free choice for the member as to the type of fund, residual assignment based on age and restrictions on choosing the higher-risk funds for people who are about to retire or who are already retired. In brief, multifunds increase freedom of choice and, by so doing, increase the need to inform and educate the contributor.

A second point, already achieved at the level of regulations in Chile's case, which offers a very interesting possibility for solving by way of the market one of the basic problems in the industrial organization of the system, is the widespread provision of social security services by Internet.

Since November last year this alternative has been available in Chile. Apart from the fact that this undoubtedly improves the quality of the service, it brings the member to the AFP by a click on the screen. The social security service by Internet, when it also offers the possibility of changing from one AFP to another, at the same time encourages commercial de-intermediation, thereby breaking the somewhat perverse, but nonetheless real, link which existed between turnover and competition of members on the one hand and commercial expenses on the other. Internet therefore serves as a mechanism allowing the member to “vote with his/her feet”, with low transaction costs, because there is no need to go through intermediaries or waste time. This encourages the play of prize and forfeit which every competitive market should offer the client in order to stimulate efficiency on the supply side. What is more, it does so without that mechanism of belonging to one AFP rather than another –the prize and forfeit mechanism– being contaminated by contributors having to pay the higher commercial costs or increased commissions which were necessarily felt to be associated with the turnover of portfolio achieved by the performance of the sales force.

There are therefore market mechanisms here which may go at least part-way towards solving one of the main problems which will be considered in more depth in the second part of this paper.

As regards the achievements in internal savings and the growth of the product, Klaus Schmidt-Hebbel has provided an unbeatable explanation, so there is nothing further to add on the subject.

The person who collaborated on this paper said that the social security reform led to growth of 0.9% percentile points, close to the ceiling of Klaus Schmidt-Hebbel's analysis. Probably enthusiasm, but also the consideration of intangibles not taken into account in the quantitative analysis, make it possible to approach it. For example, it is not the same for a country like Chile, which has 80% of private foreign debt, to refinance that debt at a risk rate of 120 points over the free risk rate, as to do so at much higher rates, when the floor for external refinancing of national companies is dictated by a country risk level which is really quite low and which in turn is explained in part by the macroeconomic strength to which the system has contributed.

One is therefore right to estimate that there are other elements which should be added to the catalogue of positive factors to explain the country's growth and yet may not be adequately expressed in accounting terms, since it is not easy to make a clear separation of the component corresponding to the pension fund and 1980 social security reform within the macroeconomic strength of the country. Borrowing at 120 points over the risk rate is not the same as doing so at 300, 400 or 500 when 80% of the national foreign debt is private. There are various millions of dollars which are not left on the table, simply because the country is strong, and for that the pension system is at least partially responsible.

## **2. WHAT THEN REMAINS TO BE ACHIEVED?**

Obviously this is a selection, an arbitrary catalogue, and there may be many other subjects to be considered. It also has an idiosyncratic aspect. It is quite true that the information given here is based mainly on Chile's experience, though the author served recently as president of the international organisation of supervisors, which allowed him to collect elements from beyond the Chilean case as well.

What is lacking? It is possible to affirm that what the system lacks is roots in society. It is not a question of legitimacy. It is not that there is

active militancy against the system. Not at all. The problem is basically lack of interest, laziness, lack of information and indolence, and this, as will be seen further on, is particularly serious.

In general the surveys studied show inadequate knowledge of the pension system and a low perception of the ownership of the social security funds. In the case of the Argentine crisis, people came out on to the streets when there was “blocking” of bank accounts, but there was no similar behaviour when regulatory decisions threatened the manner in which social security assets were valued. One asset was perceived as such, and to the extent that it was affected there was a widespread reaction: the other was not. There is an ominous sign implied here: when pension funds are under attack there is a better guarantee of impunity, because people’s perception of ownership, knowledge and identification with this type of asset is less than with other types. Progress in encouraging greater social security culture among members is therefore essential.

A few months ago a survey was conducted in Chile among 17,000 people, the longest, most complete survey of the working and social security history of the Chilean people, and they were asked over 200 questions. 53% of those interviewed showed that they knew the percentage of their income that is deducted for pension purposes. How much of the monthly wage is affected? Only 53% know how much, the rest have no idea.

When asked how much they had saved in their individual accounts, 44% answered with approximate figures. If they were to be asked how many cars or houses they have, there would be no margin of error. However, if you ask them “Do you know how much capital you have accumulated? Your main or only source of future resources will depend on this”, less than half the people know.

There is a correlation between education and knowledge, so, and this is good news, there are opportunities to extend and increase knowledge in an attempt to improve these poor figures. Little by little people are showing more concern, as their age increases and their perception of what a pension is becomes more real, but it is never enough. In other words, there is increasing concern about the balance as retiring age draws near, though the percentages are still no cause for satisfaction.

There is probably another key question regarding the likelihood of being able to trust the correct interaction between supply and demand for the formation of prices and it has a very worrying answer. The question is: "Do you know how much your AFP charges you? What is the price that you are paying for the management of your social security resources?"

As far as Chile is concerned there are two components: variable commission and fixed commission. Questions were asked about both and the reply was the same: a dramatic one. Only 3.7% said that they know how much their AFP charges. Only 3.7% said that they knew and, when asked for concrete figures, were somewhere near the reality. Can there be price-based competition in this area? Can there be price demand elasticity on this point? Is there any sense in a pension fund administrator's bringing commissions down in the hope of increasing market share in this scenario of indifference and ignorance, if only 3.7% of members are affected by so doing, while for the remainder, the vast majority, such a reduction will simply mean a loss of income from commissions?

The truth is that this factor is worrying and it lies at the heart of a problem which has yet to be solved in social security price formation.

To summarize, members do not show adequate knowledge of either their monthly contributions and accumulated balance or the commissions that are being charged, and this is particularly serious when the assumption is made that the mere interaction of supply and demand and the publishing of the price are capable on their own of leading to the formation of an efficient price. This makes it imperative to create mechanisms to increase the sensitivity of the demand for social security services, thereby generating greater competition.

The bad news is that the facts are not very encouraging.

The good news is that the public, which is generally lazy, can occasionally react, and positively. To give an example: in 1998 the so-called Fund Two was created in Chile. This was a fund made up exclusively of fixed income instruments, to offer people on the point of retiring a more conservative option, where they would not be exposed to the market risk attached to the fluctuation of variable rate instruments. That alternative was not widely

publicized and only 300 people changed to Fund Two. Available alternative, lack of information, only 300 people...

The Multifund Law was passed in 2001. There was a press campaign and orientation. The regulators and those we regulate came to an agreement on content, and a campaign was launched to inform the public. What happened? A million people, who were not forced to change, decided to express their opinion and chose a fund.

It is true that natural indifference exists. But the promising aspect is that this is not fatal. The possibility of influencing degrees of information and people's degree of interest also exists, so this can be corrected over time if consistent, appropriate informative measures of social security culture are adopted.

## **2.1.Price formation: The potential of Internet for increasing competition**

A second subject, related with the previous one, refers to the formation of prices or administration commissions. At this stage of the proceedings, it is possible to admit that there are certain problems on the demand side which hinder the levels of competition to be desired in order to guarantee efficient price formation. Obviously, this is the regulator's point of view. When high net worth returns are referred to, not all readers will agree that this is a problem, or a challenge to be solved... however, it is necessary to understand that the regulator must be concerned with ensuring that the industry operates competitively and reduces the costs to be met by the members.

The demand for the service provided by the AFPs has certain characteristics which have to be taken into account: it is mandatory, it shows a high degree of insensitivity and inelasticity with regard to price and it tends to perceive the service offered as homogeneous. This leads to lack of price competition, because the demand does not usually reward that variable with its preference. We arrive at this position therefore, not so much as a result of collusions or cartels among suppliers, but simply because observation shows that a reduction in cost will not be reflected—at least equivalently—in an increase in market share. All the same, saying that the structural problems are more on the side of demand than on that of supply is not the same as saying that they do not exist, especially when significant and politically sensitive



processes are added to the above, involving market concentration and administrators' net worth returns, which in some cases may be considered downright excessive in the light of those to be seen in other similar financial activities.

This cocktail adds up to a balance which is politically unstable. It is possible to be satisfied with the present equation, but one cannot fail to realise that the situation is a delicate one, because there is a widespread perception that the administrators' profits are excessive and that entails the risk of constant political questioning of the system's industrial organization model.

However, if the "greater-than-normal" returns of the Administrators are calculated and they are deposited in the pension fund, the impact on a higher pension in the future is very low, about 0.12% per year. To put it another way, it is not so much the future of the pensions that is threatened by the current levels of commissions, but rather the public image of the system, since high yields on net worth will continue to be a cause of criticisms. These will vary in time and intensity but are unlikely to disappear if there is no increase in competition between the protagonists.

This, then, is a subject that needs a solution. And how can it be done, using market instruments?

This is where the use of Internet as a vehicle for accessing social security services can be a great help. With due regulation and interconnection of all the agents, Internet can provide a rapid mechanism for people to take the decision to join the system. In order to allow people to reward and penalize the supply –an essential element in enabling the social benefits of the stimulus to improve quality and reduce costs to be gained from the market– they must be given a process for "voting with their feet". To do this, allowing people to choose their AFP by Internet is a necessary step. Achieving its wide-spread use is an even greater challenge and on the success of this will depend the generation of a market that is more competitive, more alert to differences in yield, quality of service and price, and more prepared to take decisions as a result, to the extent that the costs of doing so are reduced to a couple of clicks on the computer screen.

If a member wishes to move to a cheaper AFP today, he/she has to go to the branch and find an agent. In other words, he/she has a

series of costs, and given his/her perception that the marginal benefit of moving is relatively low, this combination tends to lead to inertia and the lack of competition which is frequently seen. At the same time, Internet makes it possible to disassociate joining and leaving an AFP from the expensive marketing process that existed in Chile until 1997. In fact, to the extent that Internet eliminates intermediation, it disconnects portfolio turnover from high marketing costs, which in turn removes the reason put forward until now to justify the low levels of aggressiveness in the competition between the different AFPs.

“More competition, lower marketing costs” is what Internet obviously offers as a vehicle for joining an AFP. It is to be hoped that progress will be made on a big scale with this market solution to a market problem.

## **2.2.Regulatory principles for the sector**

The AFP system has already been functioning for over two decades. That period provides us with sufficient experiences to be able to draw consolidated conclusions about the positive or negative sides of the regulatory scheme or framework of the sector. Recent experiences in different countries with individual capitalization systems show that, despite the evidence of what is good and what is not-so-good as far as pension systems are concerned, the pressures of the fiscal situation often prevail to explain changes in regulations which are clearly detrimental to future pensions. This diagnosis has been an encouragement to work on stating the principles of good regulation for pension systems based on individual capitalization, explicitly and with increased clarity and force.

Work has been going on in the AIOS in order to achieve this and there is also interest on the part of the FIAP. It would seem that it is a matter of the utmost importance to work out regulatory principles which mean that investment of social security resources is channelled towards the more profitable sectors and that there is no political seizure of any kind related with these resources. In this way, priority will always be given to fiduciary responsibility and the aim of guaranteeing the best pension possible.

There is a whole series of questions to be answered on this subject: in the allocation of investments, flexible rules to allow for

adequate diversification and avoid the mandatory diversion of captive demand on certain types of investment. Of course, there is basic concern about the quality of corporate governance, particularly in the case of debt securities.

Stock market regulations which avoid value being extracted by company controllers to the detriment of minority shareholders (because the pension funds which invest in shares are by definition minority shareholders) are the basis of good corporate governance. Rules and practices which regulate attendance and active participation of pension funds at the shareholders' meetings of the companies in which they invest, mean that they exercise their fiduciary responsibility appropriately in that corporate governance.

Adequate risk-rating regulations ensure that funds are only invested in those companies and securities that are "investment grade". Regulation of conflicts of interest; rules about markets, so that transactions always take place within those systems; formal secondary markets, which guarantee free price interaction and therefore the correct formation of the price; custody and deposits, so that there is no risk to the security of the assets being held, etc.

All this may have a significant impact on future pensions if it is done well.

When one discusses these subjects in the world of politics, it would seem that the priority is always to find ways of lowering AFP commissions. But if it is explained that increasing the pension fund by the apparently excessive amount of commissions will have only a very minor effect compared with what could be expected of a good system of investments, it may help to place the subject of yield, and the conditions needed to maximize it, in the privileged position that it ought to occupy in the public policy debate.

One extra point of yield in the long term means about 25% more pension, so what is done or not done in the investment system, as far as impact on yield is concerned, is fundamental to guaranteeing pensioners a good quality of life. This must be well-stated and explained, because the investment system looks like something dry and inexplicable to the political class and general public, but it has a enormous influence on what all of them recognize to be valuable, namely the quality of pensions.

### 2.3. Wider coverage

Coverage is not a problem specific to social security systems based on individual capitalization. It has more to do with labour markets, and for this reason it hits all pension systems, especially those pay-as-you-go systems which disconnect contributions from benefits. After all, when coverage is low, the possibility of perceiving the system as the complete solution to the question of social security is weakened, and extreme efforts are needed to find solutions.

Clearly, even when one makes corrections, one is going to find that contribution levels are low, and this is so because this system was founded, like all social security, on the classic binomial of employer/worker, linked by a formal work contract, which has since been superseded by the dynamics of the labour market. Today it no longer has the same relevance as before, but there has been no attempt to adapt the mechanisms of contribution, collection or incentives to capture that part of the work force which is not included in the labour market by classical mechanisms that have been partially superseded.

Why is an employee obliged to contribute, as in Chile's case, while a self-employed worker is not? From the State's point of view, are we more concerned with the future welfare of the employee? Are we indifferent to that of the self-employed? Obviously the answer to this difference is not conceptual, but merely practical: it is easy to charge the employee and difficult to charge the self-employed. In consequence, the difference in the legal treatment of the employee has only a practical and operational basis, the one that has lasted for the past 50 years. But is something that was obvious 40 or 50 years ago necessarily so today? Do we not have certain technological developments now, certain abilities to control, that have not been explored in all their potential and that might allow us to improve our efficiency in collecting contributions from self-employed or informal workers?

It would appear that a debate is still pending, particularly in Chile's case, where the low coverage of the system is being criticized but where there has been no progress on the root issue: i.e. how to overcome the political cost of facing a taxi-driver, for example, and telling him: "Sir, as from today you have to pay contributions". If this is not done, there can be no complaint later

that the taxi-driver is not covered. The debate seems to contain a certain dose of hypocrisy when it underlines the problem but avoids the solution because of the costs involved. For this reason, and given that the solution of extending mandatory coverage to the whole work force is technically more viable than before, the relevant factor now is the will-power available to set it in motion.

Surveys in Chile show that the average income of self-employed or informal workers is similar to that of employed or formal workers. This is not a question of greater relative poverty among the former that would justify giving up mandatory savings to capitalize future pensions. The difference, as has already been stated, lies solely in the operational effectiveness of collection, and in that area there is still more progress to be made.

## **2.4. Integration and portability**

Finally, a point that is particularly attractive for Latin American countries: the portability of accounts. One of the technical strengths of the individual capitalization systems is the private ownership of the social security savings accounts. With this system being applied in a fair number of the countries in the region, many of them with common borders and considerable flows of labour migration, there is an opportunity, as yet not fully explored, to set up mechanisms to make capitalization accounts portable. This would allow workers on the point of retirement, to accumulate the savings generated in the various countries of the region in order to obtain a single pension with the sum of their savings.

Why is it not possible, as it should be, for a worker to move from Argentina to Chile to Peru or to Colombia, taking his/her social security savings to the corresponding account or accumulating them all when he/she retires? There are operational and tax problems, if you like, but it is certainly much easier to “connect” pensions in a system of individual accumulation such as this one, than in pay-as-you-go systems like those found in Europe.

And here, though a contract has already been signed with Peru, which is going through parliament in both countries, much more can certainly be done to make progress and convert the advantages in the design of the individual capitalization system into facts to encourage the international consolidation of savings made in different countries.

This is both technically feasible and necessary, and will assist increased integration between our countries. It is a possible... and pending task.

To close, it is the author's desire that what has been mentioned here in the chapter of pending tasks may be included in forthcoming meetings of this type under the heading of what has been achieved by the reformed pension systems that make up the FIAP.

# PENSION REFORMS: THE WORKER'S VIEW

NETZAHUALCÓYOTL DE LA VEGA<sup>1</sup>

In 1995, with the Reform of the Social Security Law, a new Pension System was conceived in Mexico. It was fairer and more just, with individual accounts and Federal Government support.

It was said that this would make it possible to obtain more worthwhile pensions and at the same time to reinforce workers' saving, creating a source of financing for the country's development, without the IMSS endangering the economy.

The former model was worn out and had produced a critical financial situation in Social Security itself, due to the permanent, constant transferring of resources internally to deal with priorities, without the monetary reserves to fulfil its responsibilities. If this inertia had continued, the total disintegration of the Institute seemed imminent.

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<sup>1</sup> Representative of the Confederation of Mexican Workers, Teacher of Primary Education from the Escuela Nacional de Maestros and Licentiate in Law from the Escuela Nacional de Jurisprudencia de la Universidad Nacional Autónoma de México. Secretary General of the Workers Union of the Radio, Television, Similar and Related Industries of the Mexican Republic and Social Communications Secretary of the National Executive Committee (CEN) of the Confederation of Mexican Workers (CTM).

He has had an extensive union career during which he has held various positions, such as Workers' Representative in the Technical Council of the Mexican Social Security Institute and President of the Trade Union Organization and Promotion Commission of the Labour Congress. He is a spokesman for the National Publicity Council.

At present, in the political area, he is a multi-titular Senator of the Republic for the period 2000-2006. He chairs the Labour and Social Security Committee and is a member of the commissions on Constitutional Points and on Retired People and Pensioners for the Senate.

He has been a member of the Partido Revolucionario Institucional (PRI) since 1949 and has formed part of the Consultative Council for International Commercial Negotiations.

As a result new figures began to emerge from 1997 onwards: CONSAR, AFORES, SIEFORES, which you know much better than I do. Trying to repeat the information would be a waste of time.

However, it is worth emphasizing that, with the aim of regulating the operation of the retirement saving systems, the Law itself created the National Retirement Savings System Committee, CONSAR, with a tripartite composition, the same in the Governing Body as in the Consultative and Supervisory Committee.

The Governing Body, in addition to the President's Treasury Secretary and two Vice-Presidents, is made up of eleven spokesmen, two of whom are from the workers and one more from the company owners. The Consultative and Supervisory Committee, meanwhile, is made up of 19 members, in addition to the chairman: six workers, six company owners and six government representatives.

The tripartite system in Mexico has made it possible to guarantee the interests of the different factors of production in the Institutes concerned. This tripartite system, by the way, is found in only one of the Afores, the Afore Siglo XXI, and this has increased the confidence of the workers who belong to it.

As we have already said, the new system came into force in July 1997, and from then on, in five years, the experience has been as follows:

- of 17 Afores which began with the system, 11 are still in existence and two have recently been approved, making a total of thirteen.
- 29.5 million workers have joined the system
- the total resources as of March amount to 341,000 million pesos.

However, what has also become clear is:

- That there is inequality in the commissions charged for managing workers' funds.
- That only workers with rights under the Mexican Social Security Institute (IMSS) have the possibility of joining the Afores.
- That workers have only very poor information about how each of the Afores works.
- That there are limits imposed by the law on capital investment.
- That the weak competition between administrators, via the relevant prices of the social security system as originally



designed, does not make it possible to provide workers with lower costs and better services.

- That the CONSAR lacks the legal resources to effectively fulfil its purpose of regulating, supervising and generally keeping an eye on the whole pension system.

So we come to the reform passed on 10<sup>th</sup> December 2002. As a result:

- The CONSAR now has the necessary powers to carry out its functions in such a way as to ensure better returns and improved security for the capital managed by the AFORES.
- Independent workers plus those working for the States, Local Governments and indeed any interested party, have the possibility of becoming members of the AFORE of their choice.
- Commissions have to be authorized by the CONSAR.
- Workers have the possibility of receiving more information regarding their accounts, up to twice a year.
- There is a possibility of investing in foreign securities, always with the authorization of the CONSAR and the supervision of the Union Congress.
- The tripartite Pensions Council has been set up as an additional body to control the Systems and the Management of the Individual Accounts.

Among other new ventures...

The Reform has undoubtedly meant progress, but we are not satisfied. In order to really achieve a good Pension System:

1. Commissions must be reduced and simplified so that workers can compare one with another and choose the AFORE which suits them best. This will mean improving the competitive model which justifies the existence of so many Afores and Siefores.
2. The presence of a representative of the workers is needed in each and every one of the AFORES Administrative Councils, because this would allow greater transparency, confidence and participation on the part of the true owners of the capital, in the decisions which affect their net worth at the end of the day.
3. For the Administrators of the System, this represents a big, highly profitable business, but for the worker, at a distance, there is only the guarantee of receiving a pension, and this fails to come up to expectations due to the decreases in capital which

have occurred during the time he/she has remained in the Afore and the fact that the increased returns were obtained as a result of sales, speculation and transfer of stocks between the Afores themselves.

These mergers, sales and transactions are a natural part of a market economy such as the one in which we are living, but it is vital that part of the profits obtained in each operation of this type should be for the owners of the capital – the workers themselves. A serious attempt should be made to channel these through market vehicles in order to promote productive projects and to become a further source of financing for the pension fund.

This would be a fair alternative that has to be mentioned and that should be taken into account in due course by the legislature.

The subject which gave rise to most controversy in the Congress of the Union during the debate on the reforms was the possibility of investing capital abroad. It was said that this capital should be used for building roads, installing electricity, running water, etc. arguing the lack of money for boosting the growth of the national economy and the need to invest the Afores money, preferably, internally... All this seasoned with the concept of sovereignty... However, the position of the workers' movement was always in favour of not denying the possibility of this type of investment. The law does not prevent it; what it demands is that the returns should be better. If there are returns and security for investing in that type of operation for the good of the nation's development, there is nothing to prevent it; but if in that situation there is a possibility of investing abroad, and the greater returns and security are there, then the workers are not to be sacrificed.

Fortunately the law was passed along these lines, with a certain number of healthy padlocks, with the oversight of the CONSAR and the Congress of the Union, but what must be emphasized, and with this I conclude, is that the workers' movement does not want a man to receive a low pension when he reaches the end of his working life, while we give him a medal for having allowed his money to be used for the development of the country.

What we need is for the worker to have enough money to ensure that he has a decent lifestyle, since at the end of the day this is the only purpose of a Retirement Savings System.

To promote saving, rationalise commissions, avoid excessive deductions, manage effectively, basically keeping a watch on returns and the security of the capital: these are undoubtedly the reasons behind every Pension System.

With and through those considerations, proposed by the Workers' Sector, the Senate of the Republic agreed to install a Great Commission once the reforms under discussion had been passed, with the task of analysing the system, improving and conserving it, to guarantee security and returns and allow it to respond by fulfilling its purpose of protecting the workers. That will surely be the central part of the legislation which is being prepared on the matter.

# INTERACTIONS BETWEEN THE PENSION SYSTEM AND THE POLITICAL SYSTEM

RENÉ CORTÁZAR<sup>1 2</sup>

## 1. THE CONCERN

There is concern on account of the “threats” that the capitalization<sup>3</sup> system of pensions is receiving from the political system. It is what is known as the “political risk”.

This “political risk” expresses itself mainly through changes in regulations which affect the value of the fund or the rights of the members. The most glaring example, though not the only one, is Argentina. The pensions funds were forced to sign Treasury Bills when their time deposits reached maturity. National public securities (market instruments) were exchanged for Guaranteed Loans to the National Government (totally non-negotiable assets). Then the instruments quoted in dollars were “pesified” (converted to pesos) at a rate of one peso and forty cents, at a time when the exchange rate was more than double that value (SAFJP,2003).

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<sup>1</sup> Former Minister of Labour and Social Security 1990-1994. Executive Director of Chilean National Television 1995-2000, and Director of the Centro de Estudios Laborales Alberto Hurtado (CELAH).

Economist of the Corporation of Economic Research for Latin America, CIEPLAN, Company Director and Advisor to International Organizations such as the IDB, the ILO, the World Bank and the United Nations Development Program (UNDP).

He graduated as Economist from the Catholic University of Chile and has a Doctorate in Economics from the Massachusetts Institute of Technology (MIT).

<sup>2</sup> I am grateful for suggestions received in conversations with Joaquín Cortéz, Augusto Iglesias and Salvador Valdés. The responsibility for the contents of the work belongs entirely to the author.

<sup>3</sup> In some countries the capitalization system is an alternative to the pay-as-you-go system, and in others, a complement to it.

In view of these results, there are those who have questioned the supposed ability of the new pension system to protect itself against “political risk”.

## **2. THE ARGUMENT**

I want to begin by acknowledging the seriousness of the “threats” which have occurred. These “expropriations” of net worth have an adverse effect on future pensions and damage the credibility and legitimacy of the new system.

However, in order to evaluate the strengths and weaknesses of the capitalization system when protecting itself against “political risk”, it is necessary to ask the key question: Compared with what? Compared with the pay-as-you-go system? I am using the same logic as certain people who, when asked “How is your spouse?”, reply “As compared to whom?”.

We will argue that although the capitalization system has been threatened and harmed by “political risk” in certain countries in the past few years, the damage has been slight when compared with what can happen, and has happened, to its closest rival: the pay-as-you-go system.

We shall conclude, both from the conceptual point of view and from the examples of Argentina and Chile, that though the capitalization system does not ensure “absolute protection” against “political risk”, it does provide greater “relative protection” than the pay-as-you-go system.

First, the conceptual discussion.

## **3. THE LOGIC OF THE STATE**

In order to analyse the potential “threats” that may come from the State, it is vital to understand the “logic” behind its actions. Its policies are not the result of the action of exogenous social planners (also known as “benevolent guardians of society”), but the result of strategic interaction between those who design the policies, the remaining actors on the political stage, organized society (trade unions and

business associations) and the public (never underestimate the importance of opinion polls).

Government officials have certain “objectives” in mind (even though governments are sometimes divided on these issues; their employees are also capable of acting on the basis of their own interests), but they face “restrictions” and “incentives”, often imposed by the other political and social actors.

The policies and strategies pursued by the State and the other political and social actors are put into practice in a scenario of “imperfect information”. In other words, the different actors do not have access to all the information nor the ability to process it entirely (or at least cannot do so at a cost that is reasonable for them). This means that it is necessary to distinguish between policies and strategies on the basis of whether they are more or less “visible”, since their impact will be different due to that fact alone. For example, when there is a rise in life expectancies, if the aim is to avoid increasing the deficit in the pension system, the only solution in a pay-as-you-go system is to raise the age of retirement, increase contributions or change the formula for calculating the pension. These three policies are all very “visible” to the general public. In a capitalization system, the insurance companies would offer a somewhat lower pension than existed before, when they incorporate the new life expectancy tables. In the case of a moderate change in life expectancies, this decrease in the pension would not be “visible” to most of the population. The reactions would therefore presumably be different.

#### **4. THE PRESSURES ON THE PENSION SYSTEM**

The action of the State, which is the fruit of the strategic interaction between the State, the political system, the social actors and the public and is a response, among other factors, to the economic needs and challenges facing the State, implies that the pension system finds itself facing two major pressures, among others, which we have seen emerging strongly in recent times:

- a) Fiscal pressure: it is common for fiscal difficulties or other macroeconomic needs of a similar nature, to lead to a reduction in the level of pensions or the funds set aside to pay them (there are any number of examples in the Region, the most obvious being the recent “pesification” of the pension funds in Argentina):

- b) Re-distributive pressure: it is frequent for pension systems to find themselves being pressured at the outset to favour the present generation at the expense of future generations. In fact, at each moment in time the benefits are determined by the present generation without there being any possibility of expressing the interests of future generations.

It is also common for pension systems to be pressured to benefit certain sectors over and above others (Mesa-Lago, 1989). Historically, in the Chilean pension system, as in other countries in the Region, those sectors with greater power of political pressure tended to benefit, rather than those which lacked it. This led to a situation in which there were over 100 different benefit formulas at the time when the pension system was reformed in the year 1981, and those workers with higher incomes and greater capacity for exerting political pressure generally had access to the formulas that were most beneficial to them.

## **5. THE RESISTANCES: THE “RULES OF THE GAME” IN THE CAPITALIZATION SYSTEM**

We shall be arguing that the capitalization system provides more “relative protection” in the face of “political risk” than the pay-as-you-go system, because it has three “rules of the game”, three tools with which to resist these pressures, which its rival (the pay-as-you-go system) lacks. These act as “restrictions”, which make it more difficult for the State to act when it is bent on affecting pensions, whether as a result of fiscal or re-distributive pressures:

### **5.1. Individual accounts with “defined contributions”**

Retirement pensions paid on the basis of individual accounts with defined contributions (except the minimum ones), which are generally paid by private institutions and can not normally be affected by public policies, once granted. On the other hand, the fact that there is a balance in these individual accounts which the active workers are aware of, makes it more difficult for the State to “expropriate” any part of the funds entered in those accounts<sup>4</sup>, when facing fiscal or re-distributive pressure.

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<sup>4</sup> A mechanism used by the State in some countries is to impose a “tax” on the yield of the investment portfolio, for example, by obliging them to invest in assets with

In a pay-as-you-go system, on the other hand, one only needs a change in the pension readjustment policy relative to inflation, for example, which normally produces a reaction only from pensioners and not from active workers, or a change in the benefit formula (which is normally perceived as a “promise” rather than a “right”, and in that way probably arouses less resistance than an “expropriation” of part of the funds entered in the individual account), for the fiscal or re-distributive pressure to be converted into lower pensions, whether present or future<sup>5</sup>.

In addition to the greater resistance to “expropriations”, there are three other factors, also linked with the existence of individual accounts with defined contributions, which contribute towards making re-distributions more difficult. In a capitalization system:

- i) transparency or visibility of re-distributions is needed: where there are individual accounts with defined contributions, an improvement of pensions for a specific group of workers normally calls for an explicit transfer to the beneficiaries’ accounts, with resources from an identifiable source (for example a cheque from the government which is deposited in the individual accounts or paid to an insurance company). By contrast, re-distributions in the pay-as-you-go system occur through changes in the benefit formulas for specific groups of workers, postponing to some vague future date the decision as to who is going to finance that benefit and in what way. The general public therefore has no clear perception of the true scope of the re-distribution that is taking place. It is a relatively non-visible re-distribution.

The fact that re-distributions are more visible in the case of individual accounts with defined contributions has a series of consequences. Among others, the general public will tend to reject re-distributions towards higher-income sectors of workers, which were precisely those which benefited most from the re-distributions in the different pay-as-you-go systems, and this will make them more difficult to carry out. (This is certainly what happened in Chile’s case, and in various other countries in the Region).

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a lower return. Although the final result is the same, the mechanism is “slower” and therefore offers better protection compared with direct “expropriation” of the money invested.

<sup>5</sup> Some countries in the Region have constitutional restrictions on altering benefit formulas.



I experienced this personally. At the beginning of the year 1990, just a few days after the beginning of the first democratic government, under Patricio Aylwin, I received a visit, as Minister of Labour and Social Security, from the copper workers' trade unions, representing one of the best-paid groups of workers in the country. The reason for the visit: They wanted the age of retirement to be brought down, but without the pension being any lower than what they would have received at the "normal" age. I pointed out to them that the only way of doing this under the new pension system was for the State to deposit a cheque in the account book of each active worker for the amount necessary to bring forward the retiring age by the number of years that they wanted. They looked at one another. It was obvious that it would not be politically viable to draft a law to transfer public money, transparently, to the workers who were relatively speaking the best-paid in the country. They stood up and I never heard anything further from them. I could not help thinking of the same conversation under a pay-as-you-go system. The only thing needed would have been a change in the law, saying that the age of retirement was being brought down, with no need for transparency about the magnitude of the re-distribution. It is not surprising that this should have been such a widespread practice.

- ii) in a capitalization system it is necessary to re-distribute "stocks" and not "flows": in a system with individual accounts with defined contributions, the re-distribution has to be for the present value of the total of the increased flows that the benefiting workers will perceive in the future: in other words, for the "stock" which is being re-distributed (the cheque deposited by the government in the individual account must increase the balance at the moment of retirement, so that the insurance company will offer the desired amount in the life annuities)<sup>6</sup>. In a pay-as-you-go system, a government needs only to consider the increased "flows" that it will have to pay those workers due to retire during its period in office, and only a small fraction of the total amount to be re-distributed corresponds to them.

In the example of the copper unions, if the Aylwin government had accepted the petition, it would have had to assume the total

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<sup>6</sup> It is possible to defer the payments over time to a certain extent but, in short, the size of the transfers that will have to be made to workers' individual accounts must be made explicit from the outset.

amount to be re-distributed, as a cost. In the case of a pay-as-you-go system, it would have been only the flows of the pensions to be paid in those four years. The rest of the cost of re-distribution would have been endorsed implicitly to future governments.

- iii) re-distributions take more time: we have indicated that in order to improve the pensions of a sector of workers it is necessary to increase the contributions in their individual accounts by an amount equivalent to the stock that is being re-distributed. Since it is not usually possible to assign large quantities of resources to solve the problem once and for all, a period of many years is usually needed for the accumulated sum to make a real impact on the pensions. By contrast, in a pay-as-you-go system it is possible to make a rapid improvement in the benefits of the (proportionately) few who are retiring, on the basis of a small fraction of the contributions of the total mass that is working. The fact that re-distributions take far longer in a system of individual accounts with defined contributions drastically reduces the demand for this type of policy. Particularly, if the workers have a high discount rate between periods, the benefits to be received in twenty or thirty years' time are not perceived today as being very attractive<sup>7</sup>.

## 5.2. Property rights

However, the existence of individual accounts with defined contributions is not the only thing that makes it more difficult for the State to influence the pension system by means of fiscal or re-distributive pressures. The existence of property rights over the funds deposited in such accounts also produces an effect in the same direction. These property rights make the "expropriation" of balances from the individual accounts even more difficult.

It is not that the State cannot "expropriate" part of the balance when there are investments in assets, with property rights attached. It is simply more difficult to do so. In this sense, the property rights become additional "restrictions" on the conduct of the State. We need to remember that the State acts not only on the basis of its "objectives" but also on that of the "restrictions" and

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<sup>7</sup> We have referred to the greater or lesser probability of their being re-distributions in both systems when they are operating "normally". The re-distributive impacts that occur once only, when passing from one system to another, are a different matter.

“incentives” that it faces. The point then is not one of impossibility, but rather of “likelihood”.

In any case, it would also be possible to argue that in a pay-as-you-go system, whenever the State changes the value of the pensions or the benefit formula, a kind of “expropriation” takes place in relation to the promises made by the system. However, as Peter Diamond (1997) argues, the “likelihood” of this “expropriation” taking place, versus that of a capitalization system, is quite different.

Diamond (1997) argues that the likelihood of expropriation becomes steadily less as one moves from implicit public debt in the social security system (promises that are often not kept) to explicit public debt in the social security system, from there to explicit public debt in general, to private assets in funds used only for social security, and to private assets for general use.

It may be deduced that property rights would become an additional restriction if the State were to want to influence pensions.

### **5.3. Private, competitive management**

There is a third “rule of the game” which makes the capitalization system better able to resist fiscal or re-distributive pressures. This has to do with a separation, and therefore a certain opposition of interests, between those who manage the system and those who exercise the regulatory or supervisory function. It is this separation which makes it possible for the administrators of the new pension system to fully exercise their fiduciary responsibility in defence of the members’ interests<sup>8</sup>.

These are the conceptual arguments which suggest that the capitalization system offers greater “relative protection” against “political risk” than the pay-as-you-go system<sup>9</sup>.

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<sup>8</sup> The existence of the “single corporate purpose” for pension fund administrators also helps towards achieving this same end.

<sup>9</sup> The pay-as-you-go systems can be modified to cope with some of the problems we have mentioned. In fact in some developed countries, innovative institutional amendments have been introduced in this area. For example, in the system used in the USA, when the government improves the benefits for some group, there is a “panel” which analyses the effect on future deficits, so that the evaluation of the impact of the re-distributions is not postponed in an imprecise manner to some future date.

Let us now look at some recent examples: those of Argentina and Chile.

## **6. TWO EXAMPLES: ARGENTINA AND CHILE**

The empirical evidence of Argentina and Chile points in the direction of the hypothesis that we have suggested; in other words, that the capitalization system, though not immune to “political risk”, stands up better to pressures from the State than the pay-as-you-go system.

### **6.1. Chile**

Chile has workers whose pensions are determined by a pay-as-you-go system and others whose pensions are determined by a capitalization system.

If we analyse first of all the development of the capitalization system during the past two decades, we can see that it has suffered no change at all as a result of fiscal and re-distributive pressures. And this is not for lack of imagination on the part of the political system. There have been a large number of proposals regarding possible uses for the pension funds, ranging from the purchase of housing for the beneficiary to the possibility of having recourse to the funds in the case of needs in the area of health, or education. However, the existence of “resistances” in the form of individual accounts with defined contributions, property rights and private fund management has proved sufficiently powerful to prevent any of these ideas from being put into practice. Another point that has contributed to this result is the fact that, in Chile, social security reforms can only come from projects drawn up by the government (it is an area in which members of parliament cannot initiate legislation).

By contrast, significant changes have been introduced in the pay-as-you-go system (Godoy and Valdés, 1997). On the one hand, in 1985 the government decided, as a result of “fiscal pressure”, to “skip” a 10.6% re-adjustment which should have been applied by law to all pensions. In 1987 and 1988 differentiated readjustments

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However, given the political and institutional situation in Latin America, most of these “corrections” to the pay-as-you-go system are simply not viable.

were made, depending on income strata (with lower readjustments for those with higher pensions), which meant a lower total cost. In that sense the readjustments in those years may be understood as the result of a combination of fiscal pressures (an attempt to spend less) and re-distributive pressures (an attempt to re-distribute income between pensioners). In 1989 the pension readjustment was brought forward for those with low incomes in view of the presidential election due to take place that year; the reason in this case being basically re-distributive pressure. Then, between the years 1990 and 1993, all pensions were raised by 10.6%, starting with the lowest. Once again, the reason here was re-distributive.

## **6.2. Argentina**

In the case of Argentina (SAFJP, 2003) the recent crisis ended up by having a deleterious effect on both systems. In the pay-as-you-go system, (macroeconomic) fiscal pressure meant that the purchasing power of pensions was allowed to fall. In the first six months of the crisis alone, (the first half of 2002), it fell by almost 25%. As for those who had retired under the new system (who are still very few), their total pensions also fell, though the proportion was less than those in the pay-as-you-go system. This was due to the fact that the capitalization component<sup>10</sup> was reduced by less, with income quoted in dollars being given a revaluation of 40%<sup>11</sup>.

On the other hand, as we have already indicated, in the capitalization system the pension funds were obliged to sign Treasury Bonds when time deposits reached maturity; national public securities (market instruments) were exchanged for Guaranteed Loans to the National Government (non-negotiable assets), and finally, instruments quoted in dollars were “pesified” at one peso forty cents, with an exchange rate of over three pesos per dollar.

All these changes constituted a kind of “expropriation” of the pension funds. Does this mean that the existence of “property rights” over the funds in the capitalization system is of no value in “resisting” fiscal and re-distributive “pressures”, or the “political risk” often faced by social security systems?

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<sup>10</sup> The total pension is made up of a capitalization component and another pay-as you-go component.

<sup>11</sup> 95% of the pensions granted under the new system had a part that was quoted in dollars.

Of course “property rights” are of value. It is simply that the protection is “relative” and not “absolute”. We should remember that Diamond (1997) says that the probability of expropriation becomes steadily less as one moves from implicit public debt in the social security system (promises that are often not kept) to explicit public debt in the social security system, to explicit public debt in general, to private assets in funds used only for social security and to private assets for general use.

In the case of Argentina, with time deposits being frozen and later “pesified”, not only were the funds for social security “expropriated” but even private assets for general use. As the legal saying goes: “he who is able to do more, is able to do less”. So, the fact that there have been “expropriations” of the pension system does not invalidate in any way the fact that the funds are better protected than those in the pay-as-you-go system, where there is only implicit public debt in the social security system (promises that are often not kept). It was just that the crisis was of such magnitude that neither system was able to stand up to it effectively.

## **7. THE POLITICAL ECONOMY OF ADJUSTMENT**

So far we have referred to the degree of relative “resistance” to fiscal and re-distributive “pressures” in the capitalization system compared with the pay-as-you-go system, and therefore the differing ability of the two systems to face up to particular crises.

But there are also differences between the two systems with regard to the way they are adjusted in “normal” times, to cope with changes in life expectancy, earnings and interest rates. Both systems have to adapt to changes in these variables, but they do so in different ways.

### **7.1. Market versus political system**

For example, in the case of the pay-as-you-go system, an increase in life expectancies has to be coped with<sup>12</sup> either by lowering the amount of the pensions paid, by increasing the contributions for active workers (thereby decreasing their liquid income) or by

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<sup>12</sup> If increasing the deficit of the pension system is not a desirable option.

raising the age of retirement. All three measures are highly unpopular, and it is not unusual for the governments to remain paralysed, unable to apply any of them, while the deficit in the pension system continues to grow, year after year.

In a capitalization system, however, the individual worker can cope with the increase in life expectancies by accepting the lower pension that he/she will be offered by the insurance company, by postponing his/her date of retirement, or by depositing a voluntary contribution (over and above the legal one) in the pension book. As may be seen, the nature of the adjustment which has to be made is very similar to that of the pay-as-you-go system. The difference is that it occurs automatically in the market, without the political system being involved in the process<sup>13</sup>.

The fact that in the capitalization system the adjustment takes place through the market and not through the political system is a consequence of the existence of “defined contributions” (instead of the “defined benefits” of the pay-as-you-go system), with the resulting accumulation of funds<sup>14</sup>.

## **7.2. Visibility**

The fact that adjustment to changes in life expectancies, interest rates or wages happens through the market and not through the political system in the capitalization system makes this adjustment less “visible”. As it takes place at individual level and not through the political system, and happens constantly rather than in a cautious way<sup>15</sup>, it becomes a gradual, “low-profile” process which generates less resistance.

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<sup>13</sup> It is theoretically possible to have automatic rules within a pay-as-you-go system, avoiding the adjustments via the political system (Valdés, 2002). However, in practical terms, this is not what has actually happened with the pay-as-you-go system in Latin America.

<sup>14</sup> Unlike the greater ability of the capitalization system to resist fiscal and redistributive pressures, in this case it is not also the existence of individual accounts, property rights and private fund management that produces results.

<sup>15</sup> It is not that retirement age should rise significantly every so often (for example, from 65 to 70 years of age) as happens with legislative changes in the pay-as-you-go system, rather that every year, as life expectancy increases, a small modification is made to the proposal of the life insurance companies (or the Pension Administrators in the case of “programmed withdrawal”) in the form of a small reduction in the pension offered; which can be avoided by a small increase in the number of months worked.

## **8. IS THE CAPITALIZATION SYSTEM UNDER THREAT?**

However, quite apart from the relative ability of the capitalization and pay-as-you-go systems to cope with fiscal and re-distributive pressures or the ability of one system or the other to adjust to changes in life expectancies, interest rates or wages, there are other question marks over possible “threats” which may exist, regarding the survival of the new system as such.

Although there are people and sectors that oppose the new system in all the countries, I believe that they will be unsuccessful in their attempt to reverse the reforms, for two reasons:

### **8.1. Inertia**

Every institutional framework, or set of “rules of the game”, produces its own “inertias” to change<sup>16</sup>. Just as there were resistances in the past to the change from a pay-as-you-go system to a capitalization system, today there are inertias that would make it difficult to move from a capitalization system to a pay-as-you-go system.

This is the case, for example, of the “constitutional rules”. In Chile’s case, reforms to the social security system can only be initiated by the Executive. That in itself gives a certain inertia to the system in existence, whatever that may be.

But “inertias” also arise from the area of the organizations. When there was a pay-as-you-go system, there was resistance to change on the part of the state organizations that managed it. Now the resistance to change occurs on the part of the private institutions managing the pension funds<sup>17</sup>.

There are also inertias coming from the field of the economy. When one wants to change from a pay-as-you-go system to one of capitalization, the pressure on the public sector, which has to continue paying pensions even though it is no longer receiving contributions, becomes a source of inertia which hinders change. But the same thing occurs if one wishes to travel in the opposite

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<sup>16</sup> What is sometimes called the “lock-in” (North, 1990)

<sup>17</sup> Also on the part of the public institutions that supervise them.



direction: from a capitalization to a pay-as-you-go system. There are invested funds, property rights and a certain method of functioning in the capital market that would be affected<sup>18</sup>.

## **8.2. International trends**

It is common for social security institutions to imitate one another between countries. This happened when the pay-as-you-go systems were introduced and also took place when the capitalization systems were established in Latin America. In that sense, the “international trend” has a clear influence on the probability of the various reforms (Orenstein, 2003).

What usually happens is that the less successful countries copy the more successful ones, and among the latter there are no serious proposals in the Region today to reverse the trend towards a capitalization system.

On the other hand, these international trends have often been reinforced by multi-lateral organizations, which include such reforms in the conditions for granting their loans. Neither has there been a dominant trend in these international organizations (World Bank, IMF) favouring a return to the pay-as-you-go system.

For both these reasons it is possible to state that “international trends” are still in favour of the capitalization systems and therefore constitute another force indicating the stability of the new pension systems.

The fact that inertias and international trends point in the direction of the continuity of the capitalization systems does not prevent there still being many sectors with ideological positions that are opposed to them, and pressures of “state corporatism” of groups within the State which would prefer to go back to managing the pension system.

## **9. WHAT IS TO BE DONE? BY WAY OF CONCLUSION**

Both the conceptual discussion and the evidence of Chile and Argentina indicate that, although the capitalization system has

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<sup>18</sup> This inertia will be increasingly important, the more the pension system is inter-related with the capital market.

suffered serious threats, it is still stronger for coping with “political risk” than the pay-as-you-go system.

To close, I would like to make a few proposals which are aimed at strengthening the new system even further:

### **9.1. Constitutional rules**

The Chilean experience shows that these can contribute to stabilizing the new system. The fact that possible reforms to social security can only be initiated by the executive is a help, and the existence of high “quorums” for approving reforms in this area would also work in favour of the system’s stability<sup>19</sup>.

### **9.2. Investment policies**

The results in Argentina would have been different (and in other countries in Latin America) if the pension system had not been forced to hold particular state assets; the existence of broader foreign investment margins would also have contributed to better results (because it would have avoided so much concentration in public papers).

### **9.3. Complementary policies**

There are various complementary policies which contribute towards the reinforcement of the capitalization system, for example, extending the institutional framework of the pension system to other fields within social security. This is not only effective from the point of view of social security itself, but also, at the same time, lends legitimacy to the system and give its more “inertia”. A natural field of “extension” is unemployment insurance. The traditional systems of unemployment insurance (in which the State pays workers a subsidy when they are unemployed) have been identified as one of the causes of the increase in unemployment in Europe, as also in Latin America. When the insurance guarantees a significant proportion of the wage, it becomes a victim of so-called “moral hazard”. Workers are more likely to become unemployed and to remain in that

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<sup>19</sup> Although it is important to avoid the social security systems becoming “unreformable”, in the attempt to achieve greater stability.

position for a longer time. These traditional types of insurance also encourage informality: people declare that they are unemployed (in order to claim the insurance) but work without a contract. Since the benefits are paid by the government, these traditional systems of unemployment insurance often generate large fiscal deficits. All this changes when there is a move to a capitalization system of unemployment insurance (which can be combined with minimum benefits guaranteed by the State). If the benefits are paid out of contributions that have been capitalized in an individual account, the moral hazard and informality incentive disappear, together with the pressure on fiscal deficits. It not only makes a contribution towards protection against unemployment, but also helps to give legitimacy and increased inertia to the capitalization system, since transforming it would mean seeking an alternative not only to the pension system but also to those other social security institutions which have developed on the basis of such individual accounts.

The development of other initiatives, such as voluntary social security saving, also contributes to reinforcing the capitalization system.

#### **9.4. The role of the industry**

Finally, if it is a matter of reinforcing the system, the natural question arises: Who can carry out the task? An individual company (a pension fund administrator) does not have the incentives to create this “common good”<sup>20</sup>. It can only really be tackled by the joint action of the industry.

We have said that the main threats (just as the main positive developments) arise from possible action on the part of the State. We have, on the other hand, argued that such action by the State is the result of the strategic interaction between it and the other political and social actors. It is therefore of fundamental importance to have a strategy which includes: i) identifying the main actors (with power) who may have a bearing on the future development of the capitalization system: in the political system,

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<sup>20</sup> An individual company faces a reward structure known as the “prisoner’s dilemma”, which means that it does not provide this common good on its own.

the government, parliament and parties; in the social organizations, the trade unions, business associations and business sectors outside the social security area (for example, those who sell assets to the pension funds), among others. It is important not to forget the news media and their effect on the general public; ii) identifying their interests (the aims of each of the actors involved), iii) understanding their rationale (do not expect a perfect rationale, because they generally do not have one); and iv) a conclusion from recent episodes suggests that it is indispensable to have a proactive attitude towards all the actors. Do not wait for the wave to come any closer. Define a precise strategy in relation to the main social and political actors; play a leading role in designing reforms to improve the system (such as voluntary social security saving and multifund systems) and develop a clear communications strategy (what to say, when to say it and who to say it). This is the only way to avoid future threats which may have a de-stabilizing effect on the system.

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# INDEX

PRESENTATION

7

## PART I RESULTS OF THE REFORMS

### REFORMS IN LATIN AMERICA

#### **Pension Reforms in Latin America: Design and Experiences**

*Robert Palacios*

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