PORTFOLIO DIVERSIFICATION RULES IN MANDATED DEFINED CONTRIBUTION PENSION PLANS

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I have recently worked on the Peruvian capital markets in the context of a technical assistance program from the International Monetary Fund (IMF). One major component of this work related to the mandated defined contribution pension system. Among other things, we have looked at the diversification rules for such plans, minimum return guarantees, commission structure and competition. The last two subjects will be touched on later in this conference, and I would like to focus my presentation on a few key points of diversification.

As we all know, regulation of investment guidelines in most mandated DC systems has been rather restrictive, and while these are being relaxed in most countries, portfolios remain significantly undiversified, both in terms of range of local investment products and between foreign and local securities.

Now, let us first recall the basic financial theory case for diversification. Essentially, this theory tells us that diversification across securities produces average returns but below-average risk, thus allowing one to move towards the efficient Markowitz frontier. There can be no doubts or confusion about that.

This would suggest that restrictions on diversification always carry a cost. A less diversified portfolio would have a lower expected return than a portfolio with similar volatility, or higher volatility than a portfolio with the same expected returns. Therefore, any restrictions on investment possibilities must demonstrably offer other types of benefits and, if any such restrictions are imposed, the regulators would do well to be very clear as to what those benefits are, when trying to regulate them.

In practice, the investment regulation of defined contribution plans is often inspired by prudential regulations applicable to banking or insurance or defined-benefit pension plans. Frequently, regulation that may make sense for these latter activities is improperly extended to the investment guidelines of the defined-contribution plans. Depending on its severity, such regulation can generate large inefficiencies and costs.
I shall try to provide both some theoretical justification of these points and some potential evidence of how large such costs can be. I would argue that the benefits of such regulation are rarely fully thought through or clearly articulated. If we were to examine the potential costs and benefits of these restrictions, most of the common investment restrictions in the Chilean-style defined-contribution systems might not survive this test.

That said, most countries with mandated defined-contribution plans have started relaxing these restrictive investment guidelines. This is a very welcome development, but one which needs to be accelerated until we have removed most of the unfortunate restrictions. So, these are the key points that I shall try to make.

WHY DO WE CARE ABOUT DIVERSIFICATION OR PORTFOLIO RESTRICTIONS?

Diversification has a very strong basis in financial theory, something that is very familiar to most of the audience here. Within the famous Markowitz framework (see Fig. 1), diversification allows you to optimise or improve the risk-return trade-off of a portfolio and reach the efficient frontier. As long as the additional asset is not perfectly positively correlated with another already within the investment universe.

![Figure 1: Basic Markowitz Investment Universe](source: prepared by the author.)
opportunity set, there will be some gain in risk-return trade-off from considering it as a potential investment. Thus, being able to choose from an unrestricted universe of assets is an advantage. This is true for all types of investment managers—whether an insurance company, a mutual fund, a defined-benefit pension or a defined-contribution pension.

WHY DO REGULATORS PLACE RESTRICTIONS ON YOUR INVESTMENT POSSIBILITIES?

Well, there is good reason for several types of restrictions. Frequently, regulators require investments to be diversified across issuers and instruments. By and large, fund managers tend to be passive or portfolio investors, and do not take an active interest in the investee company. So it would be a good idea for them not to hold too large a stake in any one company, any one stock, any one bond, a particular maturity, etc., I am not going to focus on such relatively uncontroversial investment regulations.

In other cases, there are important prudential reasons to restrict investments by a financial intermediary. If you are a bank or a defined-benefit pension plan or an insurance company, your goal is not to reach the efficient frontier in risk-return space. You are then essentially a debtor to your client. Regulators would then be concerned about your solvency and liquidity. They would and should ask you to match the assets you invest in to the liabilities you have, and in this case, asset liability matching takes priority over diversification.

These are legitimate reasons to restrict the kind of investments that certain investment managers can make. However, it is arguable whether similar ideas apply to defined-contribution plans, or if an extension of such so-called “prudential” regulation to defined-contribution plans is inappropriate.

WHY HAVE SUCH BANK/INSURANCE COMPANY TYPE PRUDENTIAL REGULATIONS BEEN EXTENDED TO DEFINED-CONTRIBUTION PLANS?

Well, I will very quickly summarize the main strands of the arguments used to restrict investments in defined-contribution plans: the first is that some of these systems rely on a state guarantee for a minimum return. With such a guarantee, the state becomes interested in preventing situations where investment returns are low, and the guarantee has to be called. This is a fair argument for intervening in investments. I am not going to dwell on it today, except to say that first, this is not
the case in all countries; and second, where there is a minimum guarantee, it may be creating very complicated incentives and it may be easier to deliver the objectives of that state guarantee through a stronger first pillar or with some type of means-tested poverty-related benefit.

A second argument is that members are unfamiliar with prudent portfolio selection and risk management. Again, I will not dwell on this issue, except to say that it is entirely true. The overwhelming majority of investors are not sophisticated, but that does not constitute a good argument for regulation to restrict the managers’ investment choices. The argument would have to be that imposing such restrictions does actually improve the outcome for most members. I am going to show that this is not the case.

A third very broad argument is that there is a principal/agent problem. Simply stated, this argument is that we cannot completely trust the asset managers (the agents) to act in the best interests of the members (the principals). Therefore, the regulators have to have some responsibility for safeguarding the members’ interests. One way of discharging that responsibility is by restricting the kind of assets that they can invest in. I think that, in general, this is a poor argument. Now, we agree that it is an important part of the regulator’s job to ensure that investment managers meet some fit and proper tests, i.e. they have the right qualifications, right governance structure, right oversight, and so forth. We also agree that in all of that, some defects will remain and the objective of safeguarding members’ interests can only be imperfectly achieved. But the point is, it cannot be more perfectly achieved by imposing investment regulations, especially by the type of restrictions actually seen in practice.

So let us take a closer look at the kind of investment restrictions that are commonly imposed on defined-contribution plans and see if they are in the best interests of the members.

A very important class of such restrictions is a minimum investment requirement, usually in public debt, the idea being that public debt is “safe” and that you should have a minimum amount in a “safe” portfolio. Without going into too many details, I’ll make a strong statement: by and large, this argument is inspired by the goal of financing public debt cheaply rather than any prudential benefits that it may produce for the final members. It is an indirect and non-transparent tax on retirement savings, and its burden may fall rather unfairly on pensioners.

Another type of restriction that is commonly used is a maximum investment limit, e.g., a rule that says that no more than, say, 30 percent of your portfolio can be in foreign securities, or no more than x percent can be in stocks or some other class of
assets perceived to be “risky”.

Let’s talk about foreign asset limits. Some of the arguments underlying restrictions on foreign investments may come from macroeconomic concerns. For instance, the economy may not have enough foreign exchange reserves, there may be pressures on the current account, there may be high inflation and concerns about currency instability, and so forth. Of course, this is a very broad field and these problems - if sufficiently acute - could make a case for some temporary restrictions on the capital account, presumably in conjunction with macro stabilization measures.

But in general, it would not be a good idea to solve these macro issues by restricting investments by pension funds. Let us make a comparison. Suppose a country has a major problem with roads or education or electricity. These may be important enough, but you would not expect the pension system to solve these problems directly. Similarly, if you have a current or capital account problem, or a problem of insufficient reserves or unstable currency, you need to treat those problems in their totality. This may involve perhaps making the currency flexible, reducing foreign debt, addressing some structural weaknesses in the export base, etc. but by and large, they do not inspire particular regulation on pension funds’ investments.

While foreign investment restrictions were commonplace, there is now a strong trend towards liberalization in both emerging and mature markets. As of now, most mature markets have no restrictions on foreign investments nor on equity in their domestic markets. By contrast, the emerging markets still continue to place substantial restrictions although these are also being relaxed steadily. In Eastern Europe, Estonia, Latvia, Czech Republic, Slovakia are some of the countries that have no foreign investment limit. In Latin America, these limits remain: they are being relaxed, but too slowly.

Now, it is often remarked that the actual foreign investments of pension funds generally tend to be within the specified limit. So one of the frequent counter-arguments is: why do we need to raise the limit if the funds are not close to the limit? I think this is not a very precise or convincing argument. If a manager is within the limit, it simply means that she/he is law-abiding, it says nothing about his/her preference for foreign investments. By and large, managers also need to be well within the limit to avoid the risk that currency or price fluctuations would put them above it.

Yet another counter-argument is that emerging market pension managers prefer to invest in domestic markets, because of the relatively high returns such investments earn in domestic markets. Again, this could well be true, and it is perfectly alright for managers to choose to do so. But our point is simply that regulations should not
force them to invest in local assets by restricting investments abroad.

Nonetheless, in terms of actual investments, we still observe a strong “home bias” in pension fund investments in both mature and emerging markets, although the share of international investments is rising. Some may argue that therefore seemingly strong restrictions on foreign investments, or for that matter equity investments, may not matter much. I want to argue in a minute that this is not the case, but let me make a technical point first. There is a problem with the data, in that most of the data on pension funds’ investment composition tends to combine the data on defined-benefit and defined-contribution plans. Now, as I said before, defined-benefit plans may well have legitimate reasons to be concentrated in investments denominated in local currency. We have to do more work to cleanly segregate defined-benefit and defined-contribution plans.

**IF INVESTMENT RESTRICTIONS ARE SO BAD, WHY DO REGULATORS IMPOSE THEM?**

As these investment restrictions are very common, it is worth taking time to understand why they were imposed in the first place. But to do so a little more formally, let us turn to Fig. 2. Suppose the regulators really want to limit the maximum amount of risk that a fund manager can take. They want to rule out the investment possibilities to the right of the vertical line in Fig. 2. But how can they do this practically? There are enormous conceptual and practical difficulties in defining the notion of risk for a portfolio, and many problems of data and measurement in real time. Enough that there is no operationally feasible way to impose and implement such a restriction.

So the regulators tend to take a short cut by saying: “don’t invest in certain classes of investment”. For example, let us say that CD’s, bonds and stocks are successively more risky. Regulators may say, “don’t invest in stocks”, or “don’t invest too much in stocks”. In the process, the idea of limiting risk gets substituted by an inefficient means of achieving that, and the cost could potentially far exceed the benefits.
For instance, when you eliminate a certain class, such as stocks, it bends the whole efficient frontier inwards (see Fig. 3). In other words, such a regulation essentially dictates managers to invest in suboptimal portfolios.
If you impose a restriction on the maximum amount that you can invest in a particular class of “riskier” security; such as stocks, you are imposing a kind of ceiling on maximum expected returns (see Fig. 4). For instance, if you allowed 100 percent investment in equity, you could reach the point “g”. If you limit equity investments up to a ceiling, you can only reach a point such as “d”, which corresponds to a maximum allowed investment in equities. Note that this caps your return but it does not limit the maximum risk that you might take, so you could be making a lot of inefficient investments. So, basically, the problem with this kind of regulation is that, however well-intentioned it may be, it does not achieve the purpose it is meant for. It allows investment managers to make both highly inefficient and very risky investments, while eliminating most of the efficient portfolios.
The next question is: even if these typical restrictions in the Chilean-style pension fund systems are inefficient, do they matter in practice? What is the potential cost of such sub-optimality? This is an important question to answer, since many systems (e.g., Chile, Peru) do report relatively high ex-post returns.

**HOW LARGE COULD THE COSTS OF SUB-OPTIMAL INVESTMENTS BE?**

To begin to understand this, let us recall, first and foremost, that the amount of money that is going into mandated defined-contribution plans can be very large in relation to the domestic capital market capitalization. This is very clear in Chile, where pension fund assets account for nearly 80 percent of GDP, and this number is rising rapidly in all countries with mandated pension plans, including Peru, Mexico, Argentina and others. These amounts are either large, or rapidly getting quite large, in relation to total domestic market capitalization.

The forced investment of such large sums in narrowly defined local investment classes creates a potential for a local price bubble in government debt or select equities or other permitted or less restricted assets. Although initially this may allow pension funds to report superior performance and create a satisfactory feeling that...
the domestic pension system is performing well, eventually this bubble may burst. In many instances, regulators have specified some criteria (say, relating to liquidity or market cap) and when private securities meet these criteria, they become eligible for pension investments. This makes it very easy to predict which securities are close to becoming eligible and provides many opportunities for front-running by the managers, all at the members’ expense.

For this reason (namely, that restrictions on pension investments could inflate the realized returns on assets they are allowed to invest in), the argument of high ex-post returns in many Latin American pension systems is less than fully convincing. But just to get some sense of the potential costs of restricting the investment universe, let me show you some data in which such difficulties of interpretation are absent. Fig. 5 shows the annual returns in USD and standard deviation on stock market indices in the fifteen members of EU from 1990–2003 and an efficient frontier constructed from the same. So, Italy, for example, had an average return and standard deviation of about 6 percent per year over this period. But at the same level of risk, a portfolio of 15 EU stock indices on the efficient frontier would have earned about 22 percent per annum. Remember that these countries had fairly open capital accounts during this time, that most of them had a relatively large national stock market, and they were part of a very highly integrated market already. So if the departure from the efficient frontier for these large, better diversified economies seems to be as large as this, you can imagine the potential gains of diversification for emerging markets.
I do not want to over-stress any of these results, as the theory merely says that the trade-off between expected returns and risk improves through diversification, and one has to be cautious in drawing conclusions from actual ex-post return and risk data, but the evidence on this point is corroborated by several studies. For example, Burtless looked at hypothetical national and internationally diversified portfolios for eight mature markets, using 75 years of data, and computed the replacement rate generated by pension plans that invested in these portfolios. As Table 1 shows, in the case of Australia, for example, a pension plan 100 percent invested in domestic bonds would have produced a 41 percent replacement rate, a 100 percent domestic stock plan would have yielded 89 percent replacement rate and a diversified value-weighted international stock fund would have produced a 118 percent replacement rate.
TABLE 1
IMPACT OF DIVERSIFICATION: PENSION SYSTEM REPLACEMENT RATES INDIFFERENT PORTFOLIO SCENARIOS

<table>
<thead>
<tr>
<th>Country</th>
<th>100% Domestic Bonds</th>
<th>50/50 Domestic Bonds and Stocks</th>
<th>100% Domestic Stocks</th>
<th>100% Stocks (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>41</td>
<td>62</td>
<td>89</td>
<td>118</td>
</tr>
<tr>
<td>Canada</td>
<td>42</td>
<td>58</td>
<td>73</td>
<td>119</td>
</tr>
<tr>
<td>France</td>
<td>33</td>
<td>48</td>
<td>60</td>
<td>109</td>
</tr>
<tr>
<td>Germany</td>
<td>36</td>
<td>46</td>
<td>57</td>
<td>313</td>
</tr>
<tr>
<td>Italy</td>
<td>37</td>
<td>44</td>
<td>48</td>
<td>109</td>
</tr>
<tr>
<td>Japan</td>
<td>27</td>
<td>46</td>
<td>85</td>
<td>124</td>
</tr>
<tr>
<td>UK</td>
<td>34</td>
<td>51</td>
<td>71</td>
<td>124</td>
</tr>
<tr>
<td>US</td>
<td>28</td>
<td>47</td>
<td>76</td>
<td>126</td>
</tr>
</tbody>
</table>

(*) DIVERSIFIED AND WEIGHTED BY MARKET VALUE

Let me briefly mention that problems of restrictive investments are compounded by many other and severe regulatory problems, including the minimum return guarantee, lack of competition, commission structure and complexities introduced by multiple funds. These are other areas we are actively researching.

Multiple funds are becoming popular: Chile, Mexico, and Peru have introduced them in Latin American countries. My quick bottom line is that they represent a welcome relaxation from the strict restrictions that prevailed before. Nonetheless, they also carry the whole panoply of regulations relating to each portfolio (in terms of investment guidelines, minimum return guarantees, and all kinds of incentive distortions) which is then multiplied 3 or 5 times. So, this represents at best a point of departure and eventually these systems will need to get rid of most of these regulations.

As to the competition, currently the pension systems in Chile, Argentina and Peru severely restrict competition between the pension funds and other asset managers. Looking at Fig. 6, you can think of the solid line as representing barriers to competition, with the entire mandated savings industry carved out of the rest of the financial space. Banks, insurance companies and mutual funds can only compete in the voluntary savings market and enjoy considerable freedom to innovate and offer different products and compete head to head, whereas the AFPs enjoy a collective monopoly over mandated savings. This lack of competition generates a lot of
negative incentive and efficiency effects compared with a system where all types a financial intermediaries are free to compete. To cure this, I would propose a different industry structure (as illustrated in Fig. 7), where mandated and voluntary savings remain separated markets, in the sense that moneys in mandated or voluntary saving accounts cannot be mixed and the former cannot be withdrawn before retirement age, but they can be managed by a common set of intermediaries and be invested in common products. Such a system would avoid many of the negative incentives and inefficiencies in the current structure of pension systems.