RISK-BASED SUPERVISION OF PENSIONS
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CHAPTER IV
SUPERVISION MODELS

This paper is based on a project on risk-based supervision of pension funds undertaken by the World Bank\(^2\) in conjunction with the International Organisation of Pension Supervisors (IOPS)\(^3\), and initiated in response to a growing number of requests from countries for assistance in the area of pension supervision. The presentation provides an initial assessment of the development of risk-based supervision of pension funds in four countries - Australia, Denmark, Mexico and Netherlands - which have been pioneering risk-based supervision in various forms. A summary paper based on detailed country reports produced by IOPS members on the pension and supervisory systems in South Africa, Kenya, Croatia, Germany and the UK provides the basis for some of the practical implementation suggestion at the conclusion of the presentation.

Models of risk-based supervision demonstrate benefits to be gained from moving away from a focus on individual transactions and strict compliance with a range of specific rules towards greater awareness of the risk profiles of supervised entities. A risk-based approach provides encouragement to supervised entities to place a greater focus on risk management in their daily operations, and promotes a safer and sounder financial system. It is expected that over time moving to a risk-based approach to supervision will create scope for supervisors to focus resources on areas of highest risk and, over time, result in a more efficient use of supervisory resources.

The utilization of risk-based methods originates primarily in the supervision of banks. In recent years it has increasingly been extended to other types of financial

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intermediaries including pension funds and insurers. The trend toward risk-based supervision of pensions reflects an increasing focus on risk management in both banking and insurance, based on three key elements – minimum capital requirements, supervisory review and market discipline. Although similar in concept to the techniques developed in banking, application to pension funds has called for modifications, particularly for defined-contribution funds that transfer investment risk to fund members.

The countries examined in the World Bank study provide a range of experience that illustrates both the diversity of pension systems and approaches to risk-based supervision, but also a commonality of the risk-based focus on sound risk management.

The World Bank paper observes that the systems being reviewed have only recently been introduced, or are still in the development phases, so that any observations can only be preliminary. Impacts are observed on the composition of pension fund asset portfolios, the extent of asset/liability mismatches and the conduct of pension fund supervision. An initial evaluation of the outcomes achieved in relation to the underlying objectives suggests that risk-based supervision shows considerable potential to improve the quality of risk management.

The Australian case provides a model of risk-based supervision which applies to both defined-contribution and defined-benefit pension funds, covers a broad range of institutions in terms of size and complexity, and applies to both open “public offer” funds and closed occupational funds. The Australian case provides a structured methodology for ranking pension funds according to the relative threat of failure and maps this to a supervisory response framework. The main focus is to ensure that all pension entities meet their “financial promises” to members and beneficiaries. The Australian model demonstrates how defined-contribution pension funds can be subjected to risk-based assessment. The model makes a distinction between larger funds which are subject to detailed assessment and smaller funds which are subject to a streamlined and more automated assessment.

The Danish case provides a model of risk-based supervision as applied in a voluntary occupational system that has achieved a high degree of coverage through collective agreements. Danish funds operate on a defined-contribution basis but offer guarantees that result in defined-benefit type of arrangements. The model demonstrates how the move towards a risk-based supervision can be a gradual process and need not involve the development of an holistic risk-rating model. The “traffic light” approach provides a stress test which can feed into a broader and more subjective assessment of pension funds. Nevertheless the results are still used to guide the intensity and scope of supervision.
The Netherlands case applies a sophisticated risk-based system in a defined-benefit pension environment. The Dutch have overlaid the risk-based supervisory system with a sophisticated solvency standard designed to ensure adequate buffers to absorb investment and other risk. The analysis framework establishes a comprehensive set of tools to evaluate all the key risks faced by pension funds. Like Australia, reasons include greater consistency in procedures, increased transparency and improved allocation of supervisory resources. A risk-based capital rule establishes buffers and funding levels based on the risk profile of the institution and reflects the basic concepts inherent in Solvency II model in Europe. The Dutch seek to build in further protection for pension fund members through stress testing (continuity analysis) and the use of conservative life expectancy factors.

The Mexican case provides a model of risk-based supervision which is in the early stages of implementation, and which is complemented by a Value at Risk (VaR) approach to controlling market risk within pension funds. The Mexican case shows how greater emphasis on risk management complements the introduction of risk-based supervision, and outlines the formal risk-management structures which are required for pension funds in Mexico. Considerable progress has been made towards risk-based supervision, but the suitability of the VaR model and the need to ease the compliance burden are seen as areas where further work is required.

The trend toward risk-based supervision of pensions is closely associated with movement toward the integration of pension supervision with banking and other financial services into a single national authority. Although similar in concept to the techniques developed in banking, the application to pension funds has required modifications, particularly for defined-contribution (DC) funds that transfer investment risk to fund members.

CONCEPTUAL ORIGINS OF RISK-BASED SUPERVISION: BASEL II AND SOLVENCY II

The movement toward risk-based supervisory approaches can be traced to the development of early warning systems for banks and the recent moves, globally, to implement Basel II. The movement toward greater risk focus is also reflected in the insurance industry. The International Association of Insurance Supervisors (IAIS) is working to develop a common international framework for assessing the solvency of banks.

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4 Basel II is the second of the Basel Accords, which are recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision. The purpose of Basel II, which was initially published in June 2004, is to create an international standard that banking regulators can use when creating regulations about how much capital banks need to put aside to guard against the types of financial and operational risks banks face.
insurers. At a regional level, work is under way in Europe on the Solvency II project that aims to adopt a risk-based approach to capital requirements for insurance companies and introduce qualitative requirements for senior management, risk management, model validation and internal controls.

Across the globe the trend is inexorably moving toward improved risk management based on the three key elements outlined in Figure 1. First, institutions themselves are focusing on improving their own risk management. They are developing risk-management strategies, and they are measuring and assessing risk in a more comprehensive manner. In many institutions this process involves the creation of dedicated risk-management units. These units are implementing controls to ensure that risk-management policies are followed and that information is presented to management and board in a meaningful fashion.

Supervisors are responding by building up their ability to assess risk. The basic tools of on-site and off-site supervision are taking on a risk focus, and specialist risk units are being created with expertise to tackle complex issues. Many regulators are facilitating improved risk management by implementing regulatory standards and providing guidance. Finally, more external parties are encouraged to take a role in the risk-assessment process, either through broadening the role of some traditional players like auditors and actuaries, or through encouragement of greater scrutiny by outside parties by means of greater transparency of reporting.

**INTRODUCTION OF RISK-BASED SUPERVISION FOR PENSIONS**

An overview of the private pension systems of the four countries in the World Bank study provides an understanding of the factors that motivated the introduction of risk-based supervision. Further background information on the pension systems of these countries is provided in the individual country papers5.

**Factors Motivating the Adoption of Risk-Based Supervision in Pension Systems**

Some of the factors that have motivated the introduction of risk-based supervision of pension funds are common to all the four countries, while others seem to be country-specific. Table 1 summarizes the motivating factors identified in the individual country studies.

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5 *Summaries of these papers are published in Brunner, G, et al. (2008).*
Preventing under-funding of DB plans was a strong factor motivating the adoption of risk-based supervision in the Netherlands. Dutch funds enjoyed the equity boom in the 1990s and started taking contribution holidays when funding ratios reached levels considered as high. However, these funding ratios proved insufficient to absorb the adverse price movements in the early 2000s—the crash of the equity market combined with the drop in interest rates led several funds to become under-funded or only marginally funded. Regulators interpreted the outcome as indicating a weakness in the supervisory approach that was perceived as lacking sufficient foresight and concern for the risks facing the institutions.

The introduction of a more risk-based approach to supervision in Denmark was also motivated by a concern with the solvency of pension providers, but the surrounding conditions were different from those in the Netherlands.

- First, the new Danish “traffic light” system preceded the equity crash in the early 2000s. By the time equity prices collapsed and interest rates declined, the new system was already in place.

- Second, the new system was introduced as a quid pro quo for a more liberal investment regime in which the ceiling on equity investments was raised to 70 percent. Danish funds were allowed to make riskier investments provided that they held sufficient capital to absorb the risk.
Third, the Danish system operates on a risk-sharing basis, which means that the system has buffers than can absorb at least part of the adverse price movements.

These differences imply that the desire to prevent under-funding was more important in the Netherlands than in Denmark. However, there was still concern with provider solvency in Denmark, justifying the inclusion of this factor.

Concern with adverse price movements was also one of the motivating factors in Mexico, although the Mexican system is a DC system where the investment risk is shifted to the individual and there is little risk of provider insolvency. The policy concern in Mexico was not the risk of provider insolvency, but the exposure of retiring workers to extreme downside losses and the extreme volatility of benefits across cohorts. It is interesting to note that, as in the Danish case, the adoption of a VaR ceiling in Mexico and the introduction of strict risk-management rules were a quid pro quo for the introduction of a more liberal investment regime that allowed pension fund managers to make riskier investments and use derivatives.

The search for efficiency gains was also one of the main motivating factors in Denmark and Mexico. In both cases, the investment regime was liberalized and pension funds were allowed to invest more in equity and other assets perceived as risky. In Mexico, pension funds were allowed to use derivatives, subject to certification by the supervisor. The relaxation of the investment regime was motivated by the perception that pension funds were constrained below the efficient investment frontier and that there was scope for longer-term improvements in the risk-return trade-off. The relaxation of investment rules was accompanied by other rules designed to strengthen risk management and constrain excessive risk-taking.

The need to establish rules that enabled pension funds to take advantage of the increasing sophistication and complexity of financial instruments and markets was a motivating factor in all four countries. The creation of these rules reflects a more general recognition by financial supervisors worldwide that it is no longer feasible to monitor all the operations of financial institutions; a more effective approach entails ensuring that these institutions have sound risk-management practices and internal controls.

In the Netherlands, Denmark, and Australia, the adoption of risk-based supervision was also driven by the need to allocate scarce supervisory resources efficiently. Supervisors need to monitor a large number of institutions, especially in Australia and the Netherlands. A traditional, compliance-based supervision would be either too costly or ineffective in these cases. The risk-based approach allows supervisors to focus their scarce resources on the institutions exposed to greater risks and/or...
with weaker risk-management capacity. This factor was less important in Mexico, where only 18 funds are allowed to operate.

The integration of financial supervisory functions in one entity also seems to have been a motivating factor in the Netherlands, Denmark, and Australia. The adoption of risk-based supervision in pensions seems to have been accelerated in the countries that integrated their agencies and adopted the same basic supervision approach to all financial institutions. There was in these cases an accelerated transfer of supervisory expertise from banking and/or insurance supervision to pension supervision. Mexico was again the exception, as the supervisory agency (CONSAR) was a single entity when the new approach was adopted and has remained a single entity.

The Main Elements of Risk-Based Supervision for Pensions

One of the main objectives of risk-based supervision in banking and insurance is to ensure that institutions adopt sound risk-management procedures and hold appropriate levels of capital. Regulators and policy makers are aware that many leading institutions have already adopted good risk-management practices, and some companies would already be able to meet the more demanding requirements of Basel II and Solvency II. These financial institutions recognize that sound risk-management practices are in the interest of stakeholders and are rewarded by the market, as indicated by the growing consideration of the quality of internal risk management by rating companies.

Pension supervisors face challenges that are in many aspects similar to those faced by bank and insurance supervisors. They recognize the need to evolve to an approach that emphasizes sound risk management by the supervised institutions in order to strengthen financial stability and ensure more efficient outcomes for pensioners. They are also aware that several pension funds in their countries have already started adopting good risk-management practices. The challenge that pension supervisors face is to ensure that all licensed institutions comply with minimum standards of risk management and hold appropriate levels of capital in the systems where this is relevant.

In order to examine the way pension supervisors have addressed this challenge, it is useful to consider the three main groups of players involved in the overall architecture of risk management (Figure 1). The first group consists of the supervised institutions. The second group is the supervisory agency, and the third consists of other market participants that may have the capacity to influence the decisions and actions of pension funds. These include auditors, actuaries, fund members, rating companies, and market analysts.
One of the main objectives of risk-based supervision is to ensure sound risk management at the institutional level. As indicated in Figure 1, the capacity of the institution to identify, measure, and manage all the relevant risks would be reflected in the following: the presence of a sound internal architecture of risk management that includes a reasonable risk-management strategy; evidence of Board involvement in risk management; the existence of risk-management functions performed by competent, independent and accountable professionals; and proper internal controls.

The question is what tools supervisors have to ensure these outcomes. As indicated in Figure 1, the broad elements of the supervisory toolkit include the regulations issued by the supervisor, including direct regulations focused on the risk management architecture and risk-management procedures; a risk-based capital rule (in the environments where this is relevant); and a risk-scoring model that guides supervisory strategies and procedures. In addition, the supervisory agency will organize itself consistent with the requirements of these elements by establishing some units focused on managing the relationships with the supervised entities and other technical units more specialized in the measurement and analysis of different type of risks.
The third group of relevant players includes those market participants who may contribute to market discipline and the adoption of sound risk-management practices by the institutions. The role of some of these players depends on regulations issued by the supervisor as well. For example, the role of the auditor may be enhanced by expanding the scope of the audits to include an assessment of the effectiveness of risk-management systems and internal controls, as well as whistle-blowing obligations. The influence of fund members, rating companies, and other market analysts may be strengthened by good accounting, auditing, and disclosure rules issued by the supervisor.

All supervisors gain an understanding of the risk profile of pension funds through their normal activities. Any basic supervision framework involves the collection of data from pension funds. This can be as basic as the collection of annual accounts; more typically it involves collection of data through a set of standard forms designed by the supervisor and submitted by the pension funds on a regular basis. Through the analysis of collected data supervisors will have a picture of the financial strength of the funds that can be supplemented by the collection of additional information from on-site inspections and the market. This information can be combined for the computation of overall risk scores for each institution.

Australia and the Netherlands have made substantial progress in building comprehensive risk-scoring models that are applied to all financial institutions, with adaptations depending on the type of institution. In the Netherlands, solvency indicators are considered as inputs to the risk-scoring model, providing a link between the risk-based capital position and the risk scores. It is interesting to note that the Australian risk-scoring model takes into consideration the institution’s exposure to financial risks (and the capacity to manage these risks) in the risk scores, even though it is applied to DC plans where financial risks are shifted to the individual members. The Australian Prudential Regulatory Authority (APRA) examines the adequacy of investment management processes, including the investment strategies, asset allocation, diversification, liquidity needs and performance measurement, and monitoring and benchmarking. It looks not only for compliance with the broad investment rules but also at how risk management compares to good industry practices. Denmark and Mexico have made only partial progress in this area. Both countries have developed elements of a risk-scoring model to guide their supervisory actions, but they have not yet developed full models.

The importance of market discipline in risk-based supervision depends fundamentally on the type of pension system and the extent to which supervisors ensure disclosure and enhance the roles of third parties such as the external auditor. In general, the market discipline pillar is more relevant in open pension systems that allow selection of the provider. Even in these cases, however, the supervisor...
must ensure proper accounting, auditing, and disclosure rules, ensuring the access of fund members and market analysts to relevant and accurate information. In each of the four countries external auditors have “whistle-blowing” obligations that require them to report material problems to the supervisor.

**OBSERVATIONS**

Review of the four early adopters of risk-based supervision for pension systems illustrates the potential for the application of these principles and methods across the full range of pension system designs.

Risk-based supervision as it has emerged for banks and insurance companies is most readily transplanted to DB pension systems such as that of the Netherlands. This is because the types of risk and associated methods that focus on solvency measurement and asset-liability matching are quite similar. The presence of return guarantees such as in Denmark creates some convergence of principles but requires more adaptations.

Application to DC systems such as Mexico and Australia impose the greatest challenges. Transferring investment risk to members requires the formulation of alternative financial risk concepts. Mexico has been innovative in applying the concept of VaR as an attempt to contain downside losses. This remains controversial, due to the limited linkages between such a short-term measure and the longer horizon of pensions. This technique may involve tradeoffs between security and optimizing long-term returns. Australia has side-stepped this challenge by simply incorporating process-based investment standards into its broader risk scoring techniques.

The use of comprehensive risk-scoring models appears to offer considerable promise for pension supervision. Moreover, there is a high potential for establishing generic models that are applicable to a number of financial institutions, which provide strong support for the integration of financial institution supervision. A consistent approach to the design of risk-scoring systems has emerged among the various countries that will provide a useful template for others to follow. Scoring systems appear to offer considerable potential for inducing an improvement in the quality of internal risk management as well, although pension supervisors may still need to complement the use of risk-scoring models with direct regulations on risk management. Scoring systems also offer the promise of establishing sophisticated metrics to guide the allocation of supervisory resources and through public disclosure a strong basis to leverage market discipline.
Evidence of the impact of risk-based methods is preliminary at best and it remains far too early to draw any decisive conclusions. There is no indication of loss of pension coverage in any setting and other measurable effects have been largely at the margins. Funding ratios in the Netherlands and Denmark have improved, but this would probably have occurred in any event, due to the recovery of the asset markets coincident with the adoption of the new methods. Portfolios in the Netherlands and Denmark have become more conservative and exhibit indications of better duration matching. In both countries pension funds seem to be looking for more flexibility in order to reduce their solvency requirements.

Some observers remain confident that the use of derivatives will increasingly allow pension institutions in the Netherlands and Denmark to hedge their risks at a reasonable cost without unduly sacrificing returns. However, it is too early to conclude that the new risk-based methods are indeed resulting in lower returns and a move away from the DB system and/or guarantees. It is also too early to assess the extent to which derivatives will allow pension funds to hedge their risks without sacrificing returns. In the two countries, the movements in pension portfolios and their implication for long-run return performance will need to be carefully assessed in the next few years.

In Australia the introduction of the risk-scoring model in conjunction with stronger licensing standards has accentuated the ongoing trend away from DB plans and has led to the consolidation of the industry, as smaller funds have increasingly been absorbed by larger entities.

In Mexico it is simply too early to draw any conclusions because the system remains in a formative stage. The early evidence provides promising indications of a more diversified portfolio associated with the relaxation of asset allocation requirements in favor of risk-based measures. However, the applicability of short-term VaR measures remains controversial, and it is difficult to assess how investment policies will evolve in the longer run, as the actual VaRs approach their ceilings.

Three more general challenges are also important in considering the utility of risk-based approaches. Most fundamental is the applicability of the risk standards to the inherent nature of pension funds. Thus far these have no direct linkage to a fully articulated concept of retirement income adequacy. There is no empirical basis for the 1 percent daily VaR in Mexico that considers how much return and volatility is appropriate, over the multiple decade investment time-horizon of the typical participant. The 97.5 percent probability standard in the Dutch FTK does not have any direct foundation in the capacity of pension funds to remain solvent over the long term, a criticism that was well voiced during the consultation period. Similarly,

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6 Financial Assessment Framework (Financieel Toetsingskader, FTK).
to the extent these are based on a perceived “average” member of the fund, they may be poorly aligned with the diverse requirements of members with widely varying time horizons and or differing risk appetites. In this respect, risk parameters would have to be calibrated to multiple portfolios or the varying financial circumstances of fund sponsors that may so complicate matters that the transparency and capacity to administer the system is lost.

A second issue is that, although the risk-based models are directed at reducing compliance burdens and improving efficiency, so far there is no accepted way to measure these trade-offs and gains. The move towards a more efficient frontier in Mexico seems to support the idea of efficiency gains. In Australia, funds appear to be better run. In Denmark pension funds now focus much more on risk in the portfolio and there is some evidence that they are managing these risks better. However, these factors are hard to measure, especially if there are welfare implications from greater volatility which have not yet shown themselves.

Finally, the political economy of the risk-based supervision of pension funds remains untested. By their very nature, these approaches presume that some level of risk is appropriate for pension funds and seek to calibrate their parameters to this standard level. None have yet weathered the kind of perfect storm of nearly simultaneous asset meltdowns and interest-rate collapse or contagion effects associated with their introduction. It remains to be seen whether politicians will be able to sustain reasonable risks when real losses to members’ accounts are incurred or will retreat into the mode of absolute security at any cost when faced with angry pensioners marching on the streets. In principle, even an event with a probability as low as 2.5 percent might occur within the period in which an individual is involved with the pension system.

Despite these challenges, risk-based supervision methods are likely to continue to gain acceptance because they offer the prospect of advantages relative to other approaches. They provide a forward-looking paradigm around which to organize supervision, that offers the promise of reduced risk of insolvency of DB funds and potential efficiency gains in DC systems that impose investment restrictions. They potentially provide a common framework to assess the relative risks of DC funds that function in a “prudent person” investment regime. However, as in all such matters, there is likely to be no free lunch. Risk-based supervision systems may lead to more conservative portfolios in DB funds and constrain DC funds to a presumed average risk tolerance, depending on how they are designed. The ability to use derivatives may to some extent mitigate these outcomes, but this is not applicable to all countries. Risk-based methods, which will enable supervisors to better allocate their scarce resources, will also impose new technical requirements and a higher level of sophistication from all parties. The further development of these systems
will be closely monitored and undoubtedly provide many more useful lessons as others consider how to proceed down this path.

IMPLEMENTATION ISSUES

IOPS members when beginning their move to a risk-based approach to supervision have been confronted with the issue of how to use and adapt existing models and approaches from other countries and sectors, efficiently leveraging off experience rather than going back to square one. The IOPS study indicates the need to adapt the models of other countries to take into account a country’s unique situation. For example, operational and legal risks are more challenging for developing countries (contagion/counter party default risk etc.), which means they need to be built into their systems more robustly. The IOPS members suggested that running a pilot project is desirable, with a few funds - to test data collection and other administrative issues, as well as internal staff capability - before making a full move to risk-based supervision.

Supervisory structures which have been designed to implement compliance-based supervision seem ill-suited to implementing risk-based supervision. This means the need to change the structure of the supervisors. The IOPS found that the amount of change required by their organizations in adopting this new approach could not be over-estimated and that it is important to allow plenty of time and flexibility to cope with such change. There seems to be a need to create a division of risk specialists to look not only at broad sector risks, but also to focus on specific risks such as credit risk, markets risk and operational risk.

Probably the biggest – unexpected – challenge encountered by the IOPS members when moving to a risk-based approach to supervision in the pension area was the issue of data collection. This proved to be a particular challenge not only in countries with developing pension industries, such as Kenya, where data is often not available, but also in highly developed pension systems, such as the UK, where the large number of pension funds is the major challenge. The IOPS points to a need to substantial improve data collection before launching the transition to a risk-based approach.

Ensuring that the supervisor has skilled staff has been a major challenge in nearly all countries. Given that risk-based supervision requires a different approach to compliance-based supervision – moving from box-ticking to making qualitative judgments – the supervisory authorities found themselves with staff who did not necessarily have the right set of skills. An upgrading of staff was therefore required, getting them to adopt a pro-active stance – which is not necessarily the natural mind-set of regulators.
External communication is just as important as internal communication in the process of moving towards a risk-based approach to supervision. Risk-based supervision can involve placing greater responsibility on the pension funds themselves, to operate their businesses prudently. In turn for this greater freedom, the pension funds are expected to “play-the-game” and demonstrate that they are prepared to accept this responsibility. Getting the pension industry to understand the philosophy of the risk-based approach is key, as the ultimate goal is to imbue a risk culture into the pension funds themselves, with the pension funds performing their own risk controls and monitoring, so that the supervisory authority only has to step in where necessary. Explaining the new system to a wide range of stakeholders is therefore critical.

One issue which arose for several authorities was the discovery that they did not necessarily have the powers to back up their new approach. The most developed risk-scoring models also have a framework of supervisory response which often requires pension funds to respond to moral suasion, or for the regulator to be able to move quickly with directions to make changes. In the case of South Africa, the FSB found that it was hamstrung: if a fund is not prepared to take remedial action, the supervisor can only intervene via the Courts and only under certain circumstances. The supervisor can, however, require more frequent reporting and may specify the information which is required from such reports. CONSAR in Mexico similarly stresses that “containing risks in the pension system in an efficient manner implies a broad risk architecture, which includes both risk-based regulation and risk-based supervision too.”

7 Financial Services Board (FSB).
BIBLIOGRAPHY

BRUNNER, Gregory; Richard HINZ and Roberto ROCHA, Editors. 2008  Risk-Based Supervision of Pension Funds: Emerging Practices and Challenges. World Bank, Washington DC.