



Toolkit for Risk-based  
pensions supervision



**Module 3**  
**Identifying Risks**



### Introductory note

Risk-based Pensions Supervision provides a structured approach focusing on identifying potential risks faced by pension funds and assessing the financial and operational factors in place to mitigate those risks. This process then allows the supervisory authority to direct its resources towards the issues and institutions which pose the greatest threat.

The **IOPS Toolkit for Risk-based Pensions Supervisors** provides a 5-module framework for pensions supervisors looking to apply a system of risk-based supervision. A web-based format allows: a flexible approach to providing updates and additions; users to download each module separately as required; and a portal offering users more detailed resources, case studies and guidance. The website is accessible at [www.iopsweb.org/rbstoolkit](http://www.iopsweb.org/rbstoolkit).

This document contains the guidance for **Module 3: Identifying Risks**

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## I. INTRODUCTION

Risk-based supervision (RBS) is a structured approach which focuses on the identification of potential risks faced by pension plans or funds<sup>1</sup> and the assessment of the financial and operational factors in place to minimise and mitigate those risks. This process then allows the supervisory authority<sup>2</sup> to direct its resources towards the issues and institutions which pose the greatest threat.

### A. Purposes

Having collected a range of data (see Module 1 of the IOPS Toolkit), including the results of quantitative tests (see Module 2 of the IOPS Toolkit), the pension supervisory authority needs to develop a method for organising and analysing this information in order to establish which risks pose the greatest threat to the supervisory authority meeting its goals. The pension supervisory authority needs to first decide which areas to focus on – based on its objectives and resources - and then identify the main risks in those areas, as well as indicators which can help detect if the risk will materialise. Risk has to be considered on an individual entity and systemic basis.

This Module 3 of the IOPS Toolkit is designed to help supervisory authorities move towards risk-based supervision in order to identify the appropriate risks. The Module provides suggestions of risks which may be considered - the following chart providing a schematic summary of how a supervisory authority's objectives and risk focus might fit together with the risk factors and risk indicators to be followed. Details of these steps will be provided in this module, including examples from IOPS members who are already employing a risk-based approach.

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<sup>1</sup> According to the OECD's taxonomy (OECD 2005), a pension fund is a legally separated pool of assets forming an independent legal entity that is bought with the contributions to a pension plan for the exclusive purpose of financing pension plan benefits. The plan/fund members have a legal or beneficial right or some other contractual claim against the assets of the pension fund. Pension funds take the form of either a special purpose entity with legal capacity (such as a trust, foundation, or corporate entity) or a legally separated fund without legal capacity managed by a dedicated provider (pension fund management company) or other financial institution on behalf of the plan/fund members.

A pension plan is a legally binding contract having an explicit retirement objective (or – in order to satisfy tax-related conditions or contract provisions – the benefits cannot be paid at all or without a significant penalty unless the beneficiary is older than a legally defined retirement age). This contract may be part of a broader employment contract, it may be set forth in the plan rules or documents, or it may be required by law. In addition to having an explicit retirement objective, pension plans may offer additional benefits, such as disability, sickness, and survivors' benefits.

In EU countries, this module may not apply to those pension funds and pension plans that fall outside the scope of the EU Directive 2003/41/EC of the European Parliament and of the Council of 3 June 2003 on the activities and supervision of institutions for occupational retirement provision, *e.g.* pensions funded via book reserves.

<sup>2</sup> Pension supervisory authorities referred to in the IOPS Toolkit for Risk-based Supervision are defined as any entity responsible in whole or in part for the supervision of pension funds, plans, schemes or arrangements in a country, or the subdivision of a country, whether invested with its own personality or not.

**Figure 1: Risk-based Supervision Process**

Source: IOPS Secretariat

### ***B. Principles and Guidelines***

This Module 3 of the IOPS Toolkit builds on the *IOPS Principles of Private Pension Supervision*:<sup>3</sup>

#### **Principle 5: Risk-based Supervision**

*Pension supervisors should adopt a risk-based approach*

5.1 In order to use their resources efficiently, pension supervisory authorities should adopt a risk-based approach, and a suitable risk-assessment methodology should be established.

5.8 Risk-scoring models should reflect the risk-focus of the pension supervisory authority (which is driven by its objectives and resources), and the net risk of relevant individual entity and systemic risk factors. These factors should be suitably weighted according to the nature of the pension system, and a risk-score derived from the probability and impact of their occurrence.

<sup>3</sup> See (IOPS 2010a)

Table 1: Risk Identification Process

Supervisory Objectives	Risk Focus	Risk Factors	Risk Indicators
Prevent Fund Failure Ensure Promised Benefits Delivered	<b>Funding and Solvency</b>	<i>Investment /market risks</i>	Funding Levels
		<i>Mismatch risks</i>	Results of stress tests
		<i>Actuarial risks</i>	Results of ALM tests
		<i>Liquidity risks</i>	Volatility measures
Prevent Excess Consumer Loss	<b>Risk-management Systems</b>	<i>Operational risks</i>	Portfolio concentration
			Asset correlation measures
			Trustee/ fiduciary knowledge
Prevent Excess Consumer Loss	<b>Risk-management Systems</b>	<i>Investment / market risks</i>	Investment strategy
			Results of VaR tests
		<i>Operational risks</i>	Management ability
			Outsourcing
Ensure Fair, Competitive Markets Promote Market Stability Prevent Financial Crime Promote Market Development	<b>Conflicts of Interest</b>	<i>Agency risks</i>	Non/late payment of contributions
		<i>Counterparty/ credit risk</i>	Outsourcing
		<i>External/strategic risks</i>	Probability of default
		<i>Law /regulatory risks</i>	Concentration and correlation
Prevent Financial Crime Promote Market Development	<b>Conflicts of Interest</b>	<i>IT risk</i>	Enforceability of contracts
			IT Security
		<i>Operational risk</i>	Sensitivity to fraud
			Custody arrangements
		Management ability	

## SECTION 1: RISK FOCUS

The first step in designing a risk-based supervisory process is establishing what risks the pension supervisory authority will focus on. Pension supervisory authorities are, naturally, driven by the level of resources which are available to them. Given unlimited resources, targeting all identified risks, running an intensive supervisory campaign and seeking to prevent almost all problems may be feasible. Yet, given the limited budgets under which all authorities have to operate, pension supervisors have to act pragmatically and decide where they will focus their attention. Indeed, it is these very budget limitations which are driving pension supervisory authorities to make the move towards risk-based supervision in an attempt to use the resources at their disposal as efficiently as possible. The supervisory authority must establish its main areas of focus before risks can be identified and managed.

### *A. Supervisory Objectives*

The authority's risk focus should be driven by the pension supervisory authority's objectives. As discussed in Module 1 of the IOPS Toolkit, supervisory objectives should ideally be clearly laid out in legislation and phrased in terms of outcomes. However, where the law is vague, the pension supervisory authority itself should clarify its goals in its own mission statement.

In some countries, where the pension supervisory authority is strictly a prudential supervisor,<sup>4</sup> the task of defining risk priorities is greatly simplified by the existence of a single statutory objective; namely, preventing fund failure. In most countries, however, the establishment of the authority's risk focus is complicated by the existence of multiple statutory objectives, including prudential soundness, preventing market misconduct, preventing financial crime, and so on, while the main objective is the protection of members and beneficiaries which has to be fulfilled at all times. Sometimes multiple objectives can raise potential conflicts. For example, in emerging market economies, supervisors are often charged with industry development as well as supervision of its prudential soundness and conduct. Such potential conflicts need to be handled very carefully in defining the supervisory authority's risk priorities.

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<sup>4</sup> Supervision can be broken down into two broad categories: prudential supervision – which has the goal of maintaining the overall stability of the sector which is being overseen; and conduct of business supervision – which is mainly concerned with consumer protection. Some authorities deal with both, whilst other countries (e.g. Australia) operate a 'twin peaks' model, separating these roles between different authorities.



### Example: The Netherlands



The De Nederlandsche Bank (DNB) explain that through their Financial Institutions Risk analysis Method (FIRM)<sup>1</sup> they aim to gain insight into the risks related to the activities undertaken by the financial institutions which they supervise, and the extent to which such risks pose a threat to the achievement of their supervisory objectives.

Legislation assigns a number of objectives to the DNB - including protecting creditors, policy-holder and the integrity of the financial system - which they believe can be fulfilled in practice by focusing their RBS risk-based supervision on the following. These four themes therefore constitute the pillars of the risk analysis within FIRM.

- Solvency;
- Liquidity (for banks);
- Organisation and control; and
- Business integrity.

Note:<sup>1</sup> A detailed description of the DNB's FIRM system is provided via the on-line manual, available at <http://www.dnb.nl/openboek/extern/id/en/all/41-117136.html>

### ***B. Nature of Pension System***

A supervisory authority's risk focus will be shaped by other factors, including the nature of the pension system. The main risks within defined benefit (DB) systems relate to funding and solvency, as well as the ability of trustees or fiduciaries to oversee DB plans. The main focus of the supervisory authority will therefore be on funding issues, and the risk-based supervisory approach is likely to include quantitative, stress test measures of how funding levels are likely to hold up in adverse circumstances (as is the case in the Netherlands or Canada, for example).

With defined contribution (DC) systems, the focus has to be on processes rather than outcomes as benefits are not guaranteed. The role of the supervisor is to ensure that the pension fund is managed in a secure way, as if the members themselves were undertaking the task. Given that risks in DC systems generally rest with individuals (despite their frequent lack of knowledge and engagement on financial issues), the focus of the supervisor should be on risks which impact on the members of the fund themselves and could involve them losing money. As discussed in IOPS Working Paper No. 12 (IOPS 2010b), which looks at DC risks in detail, investment risks may be a greater focus, whilst operational risks will also be of higher concern (given individual account type systems may be more complex to administer). Supervisors also have to consider risks related to the transition to the decumulation or pay-out phase (or at least coordinate with other supervisory authorities that have this responsibility).

The degree of competition within DC pension systems (and whether it is seen to be working effectively) will likely impact on the risk focus of the supervisory authority. Where there are limits on the way funds compete (e.g. by limiting the number of investment choices, caps on fees, entry restrictions etc.) the authority would work compliance with such limits into its overall risk assessment. However, where the market has fewer restrictions on competition, the authority is more likely to focus on misselling problems<sup>5</sup> and disclosure.<sup>6</sup>

IOPS Working Paper No. 12 on DC Supervision (IOPS 2010b) highlights how DC risk is managed in different ways in IOPS member countries – Table 1 summarising the different mechanisms which can be used. Which risk control mechanisms are used leads supervisory authorities to apply different approaches to risk-based supervision with different areas of focus. For example, in terms of investment risk, where quantitative investment limits are applied, compliance with these regulations will be built into the overall risk analysis - as is the case, for example, with the Retirement Benefits Authority (RBA) in Kenya. Meanwhile in Australia, where the Australian Prudential Regulation Authority (APRA) mainly relies on the risk-management systems of the pension funds themselves, the supervisory focus is on checking that these systems are robust and being operated effectively, and on providing guidance to ensure that this is the case. By way of comparison, in Mexico, where quantitative VaR limits are used by the supervisory authority, Comision Nacional del Ahorro para el Retiro (CONSAR), to control investment risk, the results of these stress tests are the backbone of the risk-based approach.

The number of providers also shapes the risk focus. For example, the goal of APRA's risk-based supervision is to identify risky institutions amongst the thousands of entities it oversees, whilst the pension supervisor in Chile focuses on finding problem areas within the limited number of pension funds which operate within their system.

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<sup>5</sup> It should be noted that misselling problems and other issues stemming from 'conflicts of interest' can also occur in systems where a limited number of competitors operate.

<sup>6</sup> Some countries, such as Australia, operate a 'twin peaks' model of supervision, with prudential regulation and market conduct issues being handled by different supervisory agencies.

**Table 2: Risks and Control Mechanisms in DC Pension Systems<sup>1</sup>**

Individual Risk	Potential Control Mechanisms	Details
<b>Investment Risk</b>	<ul style="list-style-type: none"> <li>• Transparency and Education</li>   <li>• Pension funds' Internal Risk-management systems</li>   <li>• Quantitative Investment Limits</li> <li>• Product Design (life-cycle funds)</li> <li>• Guarantees</li> <li>• VaR</li> <li>• Replacement Rate Targets</li> </ul>	<p>Disclosure Requirements</p> <ul style="list-style-type: none"> <li>• OECD requirements</li> <li>• Format of documents (Chile, Italy, Mexico and Slovakia)</li> <li>• Standardised between types of plan (Italy)</li> <li>• Covering risk as well as return (Hong Kong)</li> <li>• Measures of volatility (Bulgaria, Israel Italy and Turkey)</li> <li>• In some cases, require prior supervisory approval (Bulgaria, Hong Kong and Slovakia)</li> </ul> <p>Supervisor Provides Information</p> <ul style="list-style-type: none"> <li>• Check disclosure ex post (Ireland Turkey)</li> <li>• Provide information on their own websites (Chile Hong Kong)</li> <li>• Require providers to ensure members properly informed about choices (Netherlands)</li> </ul> <p>Financial Education</p> <ul style="list-style-type: none"> <li>• Prudent person rule</li> <li>• Investment strategy</li> <li>• Benchmarking returns</li> </ul>

**Costs**

- Transparency + Comparison
- Not unreasonable tests etc.
- Fee caps
- Control mechanisms
- Low cost default allocation
- Limiting switching
- Centralised collection / administration
- Centralised fund management

**Operational Risk**

- Require specific risk management structure (*e.g.* internal control unit or risk manager)
- Thematic reviews / inspections
- Publish quality of service comparisons
- Register and /or inspect service providers
- Litigate for non-payment of contributions

**Decumulation Risk**

- Compulsory annuitisation
- Promote deferred annuities (products linking accumulation and decumulation phases)
- Allow flexibility in timing and choice of annuity product
- Central quotation systems to compare products and pricing

<sup>1</sup> For further details see (IOPS 2010b).

**Example: Chile**

The pension supervisory authority in Chile oversees a mandatory, individual account style DC system managed by a limited number of commercial providers. Member choice is allowed in the system and information is provided through detailed statements (including projections) and performance and cost comparisons are provided by the supervisory authority. Investment risk is controlled via life-cycle funds following quantitative investment limits, whilst a competitive bidding process has been introduced for the decumulation stage. Non-payment of contributions is the most important operational risk which the supervisor faces, which is tackled via transparency (the supervisor publishes a ranking of providers based on quality of service) and litigation if necessary.<sup>1</sup>

Previously the supervisory authority allocated its resources evenly amongst the (limited number of) pension providers in the system. Its focus and work planning was then largely driven by following complaints. This is changing as its new risk-based approach is applied.

The focus on the supervisory authority's risk-based approach is protecting individuals' funds. Given there are no guarantees within the individual account system, the supervisor focuses on processes rather than outcomes, and asks whether funds are being managed as carefully as if the individual member themselves were in charge? Given the limited number of providers, the supervisor's focus is on identifying risk areas within funds rather than spotting high risk providers or institutions.

Based on the type of DC system it oversees, the supervisory authority's risk-based assessment focuses on the following 5 main areas of risk, and breaks these down further into the following industry risk factors:

Risk Area	Risk Factors
<b>Board</b>	<ul style="list-style-type: none"> <li>• Fit and Proper Directors</li> <li>• Risk Management Policy</li> <li>• Board Committees</li> <li>• Strategic Definition</li> <li>• Reputational Risk Management</li> <li>• Information Disclosure and Transparency Policy</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Management Composition and Structure</li> <li>• Planning, management and disclosure/ transparency process</li> </ul>

- 
- Management Information Systems
- 
- Risk Management**
- Risk culture and internal control
  - Internal and external audit
  - Compliance Risk Management
  - Fiduciary Risk Management
- 
- Operational Risk**
- Affiliates Relationship Management Risk
  - Accounts Management Risk
  - Benefits Management Risk
  - Technology Risk
  - Business Continuity and Disasters Recovery Plan
  - Outsourcing Risk
- 
- Financial Risk**
- Market Risk
  - Credit or Counterparty Risk
  - Liquidity Risk
  - Entity Solvency Risk
  - Investment Process Management Risk
- 

Note:

<sup>1</sup>A country case study highlighting how the Superintendencia in Chile manages DC risks is provided in the DC Supervision Working Paper (2010b).

### Example: Australia



Pensions in Australia are overseen by an integrated financial supervisory authority, the Australian Prudential Regulation Authority (APRA). The Australian Securities and Investments Commission (ASIC) oversees market conduct issues. Employers are required to contribute 9% to a superannuation fund for all workers. These can be company or industry type plans or personal retail funds, which are managed on trust basis. Most funds are now DC in nature.

Risks within the Australian system are largely controlled via market mechanisms. APRA's approach is based on the premise that responsibility for risk management rests with the governing boards of its regulated entities, with APRA's role to promote the prudent behavior of these entities. There are almost no quantitative limits on investments, no caps on costs and full choice of product at retirement. The main operational risk challenge is outsourcing.<sup>1</sup>

APRA's approach to risk-based supervision consequently focuses on whether prudential oversight mechanisms are working. Where a risk area or potential problem is identified by APRA, their response is likely to be to provide guidance to industry on how they can work to mitigate this risk (*e.g.* guidance notes on outsourcing risk, internal risk control etc. have been provided). Given the large number of entities which they oversee, the focus of APRA is on identifying higher risk institutions which therefore require more intensive supervisory oversight.

Based on the type of system it oversees and its prudential approach, APRA has identified the following areas as its main risk focus for DC funds:

- **Board**
- **Management**
- **Risk Governance**
- **Strategy and Planning**
- **Liquidity Risk**
- **Operational Risk**
- **Credit Risk**
- **Market and Investment Risk**
- **Insurance Risk**

Note: <sup>1</sup> Again a country case study highlighting how APRA manages DC risks is provided in the DC Supervision Working Paper (IOPS 2010b).

### C. Risk Appetite

One of the advantages of a risk-based approach is that it forces the authority to be explicit (and preferably public) about what areas it intends to focus on and the trade-offs it is forced to make. The top management of the pension supervisory authority are explicitly saying to their staff “spend x% of your time on large funds / or this set of funds.” Consequently, staff therefore have to feel comfortable about spending less time on other areas *i.e.* that ‘doing less’ will be acceptable to those higher up.

For example, a pension supervisory authority may decide that completely preventing fraud is impossible given available resources. In this case, resources may be better devoted to designing early warning flags of possible fraud and developing rapid response procedures to those signals. This decision, however, would be at the cost of knowing that some fraud will happen. In this case, “some” fraud would be classified as an acceptable risk. In contrast, leaving the pension supervisory authority open to the criticism of “acting slowly in the face of evidence of fraud” would be classified as unacceptable. Similarly, failure of a small fund may be regarded as an acceptable risk, while failure of a large fund may be classified as unacceptable.

Some supervisory authorities explicitly state that they cannot prevent all problems and failures. For example the Office of the Superintendent of Financial Institutions (OSFI), the federal financial regulator in Canada, mentions in its mandate that “OSFI’s legislation has due regard to the need to allow institutions to compete effectively and take reasonable risks. The legislation recognises that management, boards of directors and plan administrators are ultimately responsible and that financial institutions and pension plans can fail.” Indeed it is important that supervisory authorities make such statements to ensure that their risk-based approach is understood and accepted. That said, in exceptional circumstances decisions regarding where to focus and the relative importance of certain issues and areas may be taken out of the authority’s hands and is largely driven by politicians and the public. Indeed following the financial and economic crisis of 2008-2009, a ‘zero risk tolerance’ basis appeared to be in operation, with the failure of even relatively small institutions deemed unacceptable.<sup>7</sup>

One time when a financial supervisory authority may directly control its risk appetite is when it decides to exercise a lighter or more stringent supervisory regime (for example to attract financial firms to its jurisdiction or to attract individuals by giving them confidence that they are investing in the safest regime possible). However, again such policies are likely to be driven as much by political considerations as the appetite of the supervisory authority itself.

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<sup>7</sup> Some jurisdictions have guarantee funds which will top up pension benefits in the event of insolvency of the sponsor or even in cases where the sponsor is having financial difficulties short of insolvency. This alters the risk appetite of the pension supervisory authority, since their mandate, implicitly or explicitly, includes protecting the finances of the guaranty organisation. In some cases there will be a separate organisation for the guaranty fund, in which case it is not inconceivable that there is conflict between the pension supervisory authority and the guaranty organisation, but in any event the risk appetite of the pension supervisory authority will change as a result of the guaranty fund.



### Example: Australia



Sentiments about the limitations of financial supervision were expressed by the Australian Prudential Regulation Authority (APRA) in its Annual Report in 2001.<sup>1</sup> APRA stress that their supervisory approach is based on the fundamental premise that the primary responsibility for financial soundness and prudent risk management within a supervised financial institution rest with its board of directors and senior management. APRA's role is to promote prudent behaviour by financial institutions through robust prudent framework of legislation, prudential standards and prudential guidance, which aims to ensure that risk taking is conducted within reasonable bounds and that risks are clearly identified and well managed. In doing so, APRA clearly states that it does not pursue a zero failure objective. APRA cannot eliminate completely the risk that a financial institution might fail and it recognises that any attempt to do so would impose an unnecessary burden on financial institutions and 'harden the arteries' of the financial system.

APRA fully endorses the Statement of Expectations issued by the government that "...prudentially regulated institutions cannot and should not seek to guarantee a zero failure rate of prudentially regulated institutions or provide absolute protection for market participants (including consumers)." The Statement of Expectations confirms that the objective that the prudential regulation regime maintain low incidence of failure of regulated entities while not impeding continued improvement in efficiency or hindering competition. APRA intends to achieve this objective through the setting of prudential requirements and its approach to the supervision of individual institutions.

#### Note:

<sup>1</sup> The APRA Report notes that there are two aspects of prudential regulation that are not widely understood by the community: "*First, supervisory interventions are usually graduated .... Second, prudential regulators are not infallible. .... No regulator can promise a complete absence of failure: in particular, no regulator has the capacity to eliminate fraud.*" (APRA 2001) p.4.

### Example: Hungary



The Hungarian Financial Supervisory Authority (HFSA) in Hungary make clear that they do not follow a zero risk policy. The HFSA's risk-based approach requires risks to be interpreted in light of supervisory responsibilities – with the HFSA noting that the authority itself also takes risk and does not eliminate all potential threats (which it points out is impossible anyway). The requirements of the HFSA are set out in European Union and domestic regulation and in the supervisory goals, policy and strategy developed by the organisation's Board, including the following:

- Ensuring the reliable, continuous and transparent operation of the financial markets;
- Strengthening confidence in the financial markets;
- Promoting the development of financial markets based on fair competition;
- Protecting the legitimate interests of market participants;
- Supporting the reduction of risks associated with consumer decisions by providing access to adequate information;
- Actively participating in eliminating financial crime.

The HFSA's approach to risks and risk management is summarised in its *risk-taking policy*, which is approved by the organisation's Board, reviewed regularly and communicated within the organisation. The policy also defines the HFSA's risk appetite, which is continuously updated based on a balance between its objectives and resources (*i.e.* the balance between the social costs of market and institutional disturbances and the costs of supervision).

The HFSA's Board determines the amount of risk to be taken by the organisation in two steps. First, they consider the environmental risks reported by analysts, select the ones which will have the strongest impact in the coming period and assign resources to the management of these risks. Next, a threshold (risk level) is set in each activity. Reaching these thresholds triggers the allocation of resources. The HFSA note that their risk appetite is constantly affected by environmental changes, and at set intervals (or during the year), it may be necessary to revise and update the risk appetite.

## SECTION 2: INDIVIDUAL ENTITY RISK FACTORS

### A. Risk Factors

The next step in designing a risk-based framework is identifying the industry and individual institutional risks that could lead to failure to meet the supervisory authority's objectives. For example, if the primary overall objective is the protection of members and beneficiaries, and the main risk focus is therefore preventing fund failure, the pension supervisory authority must then identify the range of risks that could lead to fund failure. These are usually classified in terms of the conventional risks that pension funds face: market risk, credit risk, actuarial risk, operational risk, compliance risk, governance risk, financial crime risk, outsourcing risk, and so on. While the exact classification of these risks varies from country to country, there is a reasonably high level of commonality among supervisory authorities in their identification of key institutional risks.

One challenge which supervisory authorities can face is that the risks they analyse may be determined by the data which they have. Supervisory oversight will naturally focus on the risks which can be identified. Supervisory authorities should be aware of this issue as analysing an incomplete set of risks enhances 'model risk'. However – as discussed in Module 1 of the IOPS Toolkit – supervisors should not over-react to this problem by trying to collect reams of information on every risk they ideally would like to include in their risk analysis models. Demanding too much information from supervised entities may place too much of a burden on both these entities and the authority itself (which could end up with more data than can be reasonably managed).

The following list of possible risk factors to include in a risk assessment is designed as a check to help supervisors devising their models. The list should not be seen as comprehensive or exclusive and indeed it is important to note that each supervisory authority will need to adapt the inputs to their model according to their unique system and will be constrained by the availability of data.

#### **Risk Factors**

- **Investment or market risk:** risk of losses due to adverse movements in interest rates and other market prices - leading to underfunding in DB plans and low balances in DC accounts. The problem may materialise due to 'concentration risk' (*i.e.* the risk that the investment portfolio is not sufficiently diversified and is too concentrated on one asset or issuer). The risk may also arise due to investment in unregulated/ unlisted products. In developing economies the range of investments available to pension funds may be highly limited (due to under-developed capital markets and / or restrictions on overseas investments). In such cases the investment portfolio as a whole would be far from ideal and the supervisory authority should consider investment risk for all supervised entities within the high risk category. Investment risk can also be systemic in nature when all pension plans are affected by financial meltdowns or other economic catastrophes (as was the case in 2008/9).<sup>1</sup> 'Concentration' risk is also possible – *i.e.* risk that the pension fund's portfolio is not adequately diversified and too exposed to one asset or issuer.
- **Counterparty default risk / credit risk:** risk of loss from the failures of a counterparty to meet its obligations (this might arise if derivative instruments are being used for "liability driven

investment"). Credit risk arises from an obligor's failure to meet the terms of any contract with the institution or otherwise fail to perform as agreed, including the possibility of restrictions on or impediments to the transfer of payments from abroad.

- **Funding and solvency risk:** the risk that a pension fund does not have sufficient assets to meet its liabilities.
- **Liquidity Risk:** the risk that an institution will not be able to meet its payment obligations as they fall due without excessive cost or the total inability to recover funds or only with significant delay.
- **Mismatch risks:** risk arising from volatility in investment returns in relation to those necessary to meet liabilities, for example, adverse movements in interest rates, bond prices, stock and commodity prices, or exchange rates having a differential effect on assets and liabilities (for example a drop in interest rates which increases the value of liabilities by more than the increase in the value of assets – naively, an increase in asset value would otherwise be considered a positive development, but not if liabilities increase even more).
- **Actuarial risk:** including inappropriate actuarial valuation methods and assumptions (e.g. mortality, longevity, disability, inflation, liquidity) as well as insurance type risks within the pension plan. This can have a considerable impact on actuarial liabilities. If not assessed accurately there is a danger of overestimating, or more problematically, underestimating the value of the liabilities. Likewise inappropriate methods (departing from market value) that consistently over-estimate the values ascribed to assets could lead to actuarial risk. Again inconsistent or inaccurate assumptions may be a systemic problem within developing economies and this risk may need to be placed in the highest category for all entities which pension supervisory authorities in such jurisdictions oversee. Insurance underwriting risk is the risk that insurance cover will not be available as expected when needed (which might occur if there are significant life insurance or disability benefits in the pension plan that should be reinsured, but for which no market might exist in the country). Also under this heading would be various guarantees, such as relative or absolute rates of return for defined contribution plans
- **Agency risks:** these could otherwise be described as 'competition risk' or 'competition failure'. Issue include excessive fees, conflicts of interest, fraud misappropriation and misallocation. Agency risk can arise from simple ignorance of law and best practices, unwillingness to adopt best practices, or through wilful negligence and corrupt practices. One significant risk in both defined benefit and defined contribution plans is that of non-payment of contributions.
- **Operational Risk:** the risk of losses resulting from inadequate internal processes, people and systems – whether these are internal to the regulated entity or in a service provider. Operational risk arises from failures in transactions with counterparties, ineffective decision making, and inadequate or insufficient human and technical resources. Examples include transaction processing (correct, complete and in time), outsourcing and cooperation (assessment of mandates), expenses (levy in premium), staff (quality and quantity) information management, product development (innovation) material: (pre-) acceptance (transfer of pension rights), payment & settlement. More serious risks may also be involved, such as the risk of fraud and general natural disaster risks (e.g. damage to buildings due to fire or natural disasters, burglary or theft of fund property). Causes include internal fraud, external fraud,

employment practices, clients, products and business practices, damage to physical assets, business disruption and system failure or process management.

- **IT Risk:** IT risk is the risk arising from inadequate information technology and processing in terms of manageability, exclusivity, integrity, infrastructure, controllability and continuity IT risk also arises from an inadequate IT strategy and policy and from inadequate use of the information technology.
- **External and strategic risk:** these are the inherent risks with regard to the sensitivity of the fund to external factors. These risks arise from adverse strategic decisions, improper implementation of decisions or lack of responsiveness to changes in surrounding environment. These include risks related to demographics, competition, technology, reinsurance, conjuncture, interested parties, infection, and political stability. Strategic risks include the continued viability of an entity as a result of change in the operating environment, including internally driven change such as merger, or the coverage of a new group of participants in the pension plan (such as part-time employees – who might have significantly different characteristics and challenges from existing members). Some of these risks would not be applicable to the pension fund itself, but might be applicable to the plan sponsor and its ability to provide capital support (pension accumulation funds are more similar to commercial enterprises, so might be subject to these kinds of risk directly).
- **Legal and Regulatory Risk:** the likelihood of adverse consequences arising from the failure to comply with all relevant laws and regulations. Risks concerning changes in legislation in future may also be considered. Risks of complying with inappropriate or unclear regulation should also be put in this category.
- **Contagion and related party/ integrity risk:** risks to an entity's business as a result of close association with another entity – the risks may be direct through financial exposure or indirect through reputation damage. Integrity risk is the risk arising from ethical standards. For example injury of third parties liability, an ambiguous relationship of the fund with other financial institutions in the same group; insider trading, tax evasion, money laundering, fraud.

Note: <sup>1</sup> This risk can be measured quantitatively (as described in Module 2) – with stress tests etc. showing the level of risk undertaken by the fund (the worse the results the higher the inherent risk generated by market/ investment factors).

**Example: Netherlands**



- De Nederlandsche Bank (DNB) in its FIRM Model breaks down its risk analysis into the following categories.

Risk Category	Matching / Interest Rate Risk	Market Risks	Credit Risks	Insurance Technical Risks	Environmental Risks
Risk Item	<ul style="list-style-type: none"> <li>• Interest rate</li> <li>• currency</li> <li>• liquidity</li> <li>• inflation</li> </ul>	<ul style="list-style-type: none"> <li>• price volatility</li> <li>• market liquidity</li> <li>• concentration and correlation</li> </ul>	<ul style="list-style-type: none"> <li>• default probability</li> <li>• concentration and correlation</li> <li>• loss given default</li> <li>• exposure at default</li> </ul>	<ul style="list-style-type: none"> <li>• mortality</li> <li>• disability</li> <li>• loss</li> <li>• concentration and correlation</li> </ul>	<ul style="list-style-type: none"> <li>• competition</li> <li>• dependence</li> <li>• reputation</li> <li>• business climate</li> </ul>
Risk Category	Operational Risks	Outsourcing Risks	IT Risks	Integrity Risks	Legal Risks
Risk Item	<ul style="list-style-type: none"> <li>• (pre)acceptance/ transaction</li> <li>• processing</li> <li>• payment/clearing/settlement</li> <li>• information</li> <li>• product development</li> <li>• cost</li> </ul>	<ul style="list-style-type: none"> <li>• business continuity</li> <li>• integrity</li> <li>• quality of services</li> </ul>	<ul style="list-style-type: none"> <li>• strategy and policies</li> <li>• security</li> <li>• controllability</li> <li>• continuity</li> </ul>	<ul style="list-style-type: none"> <li>• prejudice to third parties</li> <li>• insider trading</li> <li>• money laundering</li> <li>• financing of terrorism</li> <li>• improper conduct</li> </ul>	<ul style="list-style-type: none"> <li>• legislation and regulation</li> <li>• compliance</li> <li>• liability</li> <li>• enforceability of contracts</li> </ul>

- staff
- sensitivity to fraud

## B. Risk Indicators

Having identified the main supervisory focus and the risks to meeting its goals, the pension supervisory authority has to determine what the risk indicators should be. Risk indicators can be defined as those activities or events that are likely to result in the risk materialising.

### Example: Canada



The Office of the Superintendent of Financial Institutions (OSFI) in Canada use a series of indicators which are classified into 3 tiers:

- **Tier 1:** indicators detect issues that require immediate attention and may have a significant impact on both the current state and future risk within the plan. Examples include non-remittance of contributions, contribution holidays in excess of surplus, or a plan employer facing serious financial issues. Any plan where a Tier 1 test is triggered receives immediate attention and an in-depth risk assessment.
- **Tier 2:** indicators identify potential risks with the plan that may lead to more serious issues. These include indicators such as investment returns that do not meet benchmarks, large changes in membership, and the proportion of liabilities pertaining to retired members. These are less significant than Tier 1 issues, but if a number of the Tier 2 risks arise simultaneously, an in-depth risk assessment is likely to be conducted.
- **Tier 3:** indicators capture situations that may require greater diligence or controls on the part of the administrator, but may not have significant impact on risk within the plan if properly managed. Examples include whether the plan provisions contain certain ancillary benefits, or if there has been a history of late filings for the plan.

Some authorities use external consultants to help identify these indicators. Likewise some IOPS members who have been moving towards a risk-based approach to supervision consulted other international authorities which have made such a move. However, all authorities also drew upon (what was perceived to be) more valuable internal knowledge of supervisors with experience in their specific sector.

Indicators can be quantitative and qualitative in nature. Indeed the results of quantitative tools for measuring risk (discussed in Module 2 of the IOPS Toolkit) form key indicators in the overall risk assessment of some IOPS members. For example, the results of the VaR tests undertaken by Comision Nacional del sistema ahorro para el Retiro (CONSAR) in Mexico or the stress tests required by Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) in Germany are key indicators of investment risk.



Whether to apply quantitative indicators - and which ones to apply - depends on the nature of the pension system. Some risks can obviously be more easily quantified than others – particularly those which are the focus of defined benefit systems (*i.e.* funding and solvency and ALM tests). How to measure risk in DC systems is not an easy task (as there is no benefit guaranteed and it is risks to members rather than providers which is key). Quantitative tests for DC plans are consequently more limited – with VaR assessments proving controversial, and alternatives (based on replacement rate shortfalls) still being developed. Quantitative tests are more appropriate where some form of minimum pension or guarantee is involved.<sup>8</sup>

The use of quantitative elements also differs within a risk-based system, as meeting such targets is not an end in itself but rather an indication of overall risk levels. For example, an index of the timeliness and accuracy of document filing and on-time payment of contributions to the fund may be used. In a risk based system a poor record would indicate a greater probability of future delinquency and therefore heightened attention to this risk in the future. Of course, those with a good record can go bad, but a good track record is an important indicator of future behaviour in many cases.

Module 2 of the IOPS Toolkit also discusses, how it is possible to derive quantitative measures of non-financial risks, such as operational risk. For example, ratings varying between zero and one could be given for such risks as:

- defined benefit funds and plans having a number of complicating features, such as early retirement benefits, indexation and so on;
- defined contribution plans:
  - having a large range of investment options, rather than having just a few investment funds or “life-cycle” options;
  - having one fund for all, but not allocating investment earnings on a market basis, but “declaring” the rate on a non-transparent smoothing approach and building up “reserves;”
- either type - small plans that do not outsource their functions, or plans that outsource in a non-transparent manner.

As pointed out in Module 2 of the IOPS Toolkit, while such factors are very difficult to judge and equally difficult to score numerically, they are of great utility to the pension supervisory authority, as they tend to be “leading” indicators, as compared to the numerical factors, which tend to be “lagging” (although not always, stress testing is a leading indicator). Risk scores will inevitably be somewhat subjective, so it is important that a system be in place to ensure a reasonable degree of consistency between analysts (see Module 4 of the IOPS Toolkit).

However, it is important to recognise that not all relevant risks lend themselves easily to quantitative assessment and such scores will always involve and should be combined with qualitative

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<sup>8</sup> Module 2 of the IOPS Toolkit discusses the types of quantitative indicators which can be applied to both DB and DC funds in greater detail (see Section 3 ‘Integrating Quantitative Tools into Risk Assessments’).

judgements. Indeed, there can be a danger in focusing too much on quantitative factors. Some authorities have found that making their model too quantitative - though appealing in terms of making the model objective - risks leaving too little room for the important, subjective assessment of individual entities. The Retirement Benefits Authority (RBA) in Kenya is one authority which has been adapting its original risk analysis model to focus less on quantitative tools and to allow for more qualitative judgements.

## Example: Kenya



The table below summarised the risk scoring system used by the Retirement Benefits Authority (RBA) in Kenya. Where a result is satisfactory the score is 0.

Entries in bold are to be flagged for breaches of compliance and for immediate investigation, whatever the risk score.

Scores are summed individually for each of the three categories (Inherent Risk, Management and Control, Capital Support). The overall risk score is obtained by taking (50% x Inherent Risk) + (25% x Management and Control) + (25% x Capital Support).

Risk factor	Satisfactory result	Unsatisfactory result	Risk score
1.1 Inherent risk - investment	<ul style="list-style-type: none"> <li>Satisfactory investment policy statement</li> </ul>	<ul style="list-style-type: none"> <li>Lack of satisfactory investment policy statement</li> </ul>	<ul style="list-style-type: none"> <li>1</li> </ul>
	<ul style="list-style-type: none"> <li>Recent review of statement</li> </ul>	<ul style="list-style-type: none"> <li>Lack of evidence of updating of statement</li> </ul>	<ul style="list-style-type: none"> <li>0.5</li> </ul>
	<ul style="list-style-type: none"> <li>Investment return above average</li> </ul>	<ul style="list-style-type: none"> <li>Asset class(es) outside range 80 – 120% of average</li> </ul>	<ul style="list-style-type: none"> <li>0.25</li> </ul>
	<ul style="list-style-type: none"> <li>Risk measures (e.g. diversification) below average</li> </ul>	<ul style="list-style-type: none"> <li>Individual holdings above threshold (e.g. 2% of portfolio)</li> </ul>	

		<ul style="list-style-type: none"> <li>• Non-compliance with asset limits</li> <li>• Liquidity concerns</li> </ul>	<ul style="list-style-type: none"> <li>• 0.25 to 0.5</li> <li>• 1</li> <li>• 0.25 – 0.5</li> </ul>
1.2 Inherent risk - insurance	<ul style="list-style-type: none"> <li>• insurance risk not present</li> <li>• insurance risk insured</li> <li>• capacity to handle non-insured risk</li> </ul>	<ul style="list-style-type: none"> <li>• uninsured life or disability benefits beyond capacity of scheme to absorb</li> <li>• uninsured pensions at retirement in small DB scheme</li> <li>• uninsured pensions at retirement in DC scheme – actuarial valuations</li> <li>• uninsured pensions at retirement in DC scheme – no or unsatisfactory actuarial valuations</li> </ul>	<ul style="list-style-type: none"> <li>• 0.5</li> <li>• 0.25</li> <li>• 0.5</li> <li>• 1</li> </ul>
1.3 Inherent risk – non-financial	<ul style="list-style-type: none"> <li>• relatively simple plan provisions and procedures</li> <li>• transparent outsourcing procedures</li> <li>• capacity to handle greater complexity</li> </ul>	<ul style="list-style-type: none"> <li>• defined benefit scheme with complex provisions beyond capacity of scheme</li> <li>• non-transparent outsourcing of functions</li> <li>• large number of investment options in DC schemes where capacity not present to handle this</li> <li>• non-transparent declaration of</li> </ul>	<ul style="list-style-type: none"> <li>• 0.5</li> <li>• 0.5</li> <li>• 0.5</li> </ul>

		interest in DC schemes	<ul style="list-style-type: none"> <li>• 0.5 – 1</li> </ul>
2.1 Management and control – Trustee oversight	<ul style="list-style-type: none"> <li>• satisfactory Trustee oversight process</li> <li>• satisfactorily completed governance self-assessment questionnaire</li> <li>• Trustees meeting fit and proper criteria</li> <li>• Clear lines of responsibility and accountability</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of proper oversight process</li> <li>• No or unsatisfactory completion of governance self-assessment questionnaire</li> <li>• <b>Concerns about Trustees meeting fit and proper criteria</b></li> <li>• Lack of proper documentation</li> <li>• Concerns about document filing and cooperation with RBA</li> </ul>	<ul style="list-style-type: none"> <li>• 0.5</li> <li>• 0.5</li> <li>• 1</li> <li>• 0.5</li> <li>• 0.5</li> </ul>
2.2 Management and control – Operations and control	<ul style="list-style-type: none"> <li>• satisfactory completion of interrogatories</li> <li>• satisfactory filing record, including payment of contributions on time</li> <li>• low number of complaints, complaints satisfactorily resolved</li> <li>• expenses as percentage of normal cost/contributions below average</li> </ul>	<ul style="list-style-type: none"> <li>• unsatisfactory completion of interrogatories</li> <li>• <b>unsatisfactory filing record and/or history of late payments</b></li> <li>• large number of complaints not satisfactorily resolved</li> <li>• expenses more than 20% above industry level</li> </ul>	<ul style="list-style-type: none"> <li>• 0.25 to 0.5</li> <li>• 0.5</li> <li>• 0.25 to 0.5</li> <li>• 0.25</li> </ul>

<p>2.3 Management and control – Independent review</p>	<ul style="list-style-type: none"> <li>independent professionals used in review process</li> <li>professionals in good standing</li> <li>easily understandable reports without qualifications</li> </ul>	<ul style="list-style-type: none"> <li>concerns about independence (e.g. professional is employee of organisation)</li> <li>concerns about professional standing</li> <li>unclear reports and/or qualifications</li> </ul>	<ul style="list-style-type: none"> <li>0.25</li> <li>0.5 to 1</li> <li>0.5</li> </ul>
<p>3.1 Capital support – Fund</p>	<ul style="list-style-type: none"> <li>DB schemes - funded ratio and solvency ratio in excess of 100%</li> <li>DB schemes with unfunded liability/solvency deficit – satisfactory recovery plan in place and being implemented</li> <li>DB schemes – actuarial valuation basis satisfactory compared to peers</li> <li>Rates of return on fund over last 3 years in excess of average</li> </ul>	<ul style="list-style-type: none"> <li>DB schemes - funded ratio (FR) and/or solvency ratio (SR) less than 100%</li> </ul>	<ul style="list-style-type: none"> <li>FR ≥ 1, SR = 0.8 to 1 – score 1</li> <li>FR &lt; 1, SR = 0.8 to 1 – score 1.5</li> <li>SR &lt; 0.8 (irrespective of SR) – score 2</li> <li>SR ≥ 1, FR = 0.8 and 1 – score .75</li> <li>SR ≥ 1, FR &lt; 0.8 – score 1.25</li> <li>DEDUCT 0.25 to 0.5 if recovery plan in place and being implemented</li> <li>1</li> </ul>

		<ul style="list-style-type: none"> <li>Weak valuation assumptions (e.g. interest rates more than 20% above average)</li> <li>Low rates of return (e.g., greater than 20% below industry average for type of scheme)</li> </ul>	<ul style="list-style-type: none"> <li>0.25 for each of past three years below threshold</li> </ul>
3.2 Capital support – Employer sponsor	<ul style="list-style-type: none"> <li>timely remittance of employee and employer contributions</li> <li>DB schemes – satisfactory actuarial assumptions for current service cost</li> <li>Schemes with unfunded liabilities/solvency deficits – satisfactory recovery plan</li> <li>Contribution holidays well monitored</li> <li>DC schemes – objectives and target of schemes well communicated</li> <li>Industry and scheme sponsor in good shape financially</li> </ul>	<ul style="list-style-type: none"> <li>Contribution delinquency<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>If contributions are occasionally 7 days or more in arrears, but less than 30 days score 0.5</li> <li><b>If contributions are persistently more than 7 days in arrears score 1</b></li> <li><b>If contributions are in arrears for 30 days or more score 2</b></li> <li><b>If there is a pattern of late payment score 3</b></li> <li>If contributions are less than 90% of the recommended current</li> </ul>

service cost and  
amortisation payments  
score a further 0.5

- 1
- Contributions below those recommended in actuarial report
- 0.5
- 0.25 to 1
- Poor or no monitoring of contribution holidays
- DC schemes – poor communication of targets
- Industry and/or scheme sponsor in poor financial shape

Note:

<sup>1</sup> Apply bullet 1 or 2 (which apply only if there are no significant arrears) or bullet 3 or 4, no both sets.



## SECTION 3: SYSTEMIC RISK<sup>9</sup>

Risks can be identified and assessed on two levels, on a 'micro' and a 'macro' basis – taking a 'bottom up' approach and attempting to identify risks at the level of individual supervised entities, or a 'top down' approach looking a risk on a sector or thematic basis.

Systemic risk is risk that affects all or most supervised entities, or some sub-section of them (for example all or most defined contribution funds or plans or all or most defined benefit plans) or even the whole financial sector. If all entities of a particular type are subject to this risk, it is not productive to deal with this particular risk on a fund by fund basis; it should be dealt with by improving the entire pension system. This can be challenging and might require legislative changes and/or cooperation with professional bodies.

Often, the risk assessments performed under RBS relate to specific entities, with the results triggering supervisory responses directed at each entity individually, based on its particular circumstances. However, individual risk assessments may only become meaningful once systemic risks are recognised and eventually dealt with (top down approach). Information can also flow in the other direction (from the bottom up). Sometimes individual risk assessments identify or highlight issues that are relevant to more than one entity, perhaps even to the industry as a whole, arising from current unsound practices which might pre-date more rigorous supervision, or changes in the pension environment in which firms are operating.

The Hungarian Financial Supervisory Authority (HFSA) in Hungary, for one, point out that top down and bottom up analysis should constantly interact – with entity level analysis throwing up issues which need to be considered on a sector wide basis, and thematic analysis pointing out risks which may need to be analysed further within entity specific investigations. The HFSA's risk assessment system therefore includes 'threat cards' shown on individual entity pages which are generated by macro and sector analysts.

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<sup>9</sup> The term systemic risk used in the IOPS Toolkit for Risk-based Supervision refers to both systemic risk - *i.e.* a specific factor which can have an impact on the pension sector as a whole (*e.g.* increased volatility in worldwide capital markets, as was experienced in 2008/2009) – and also 'system-wide risk' – *i.e.* a risk factor which may be prevalent in most pension funds (*e.g.* weak governance).

### Ratings in the Hungarian Financial Supervisory Authority Summary Table

Core data	Institution assessment	Supervision program	Actions	Follow-up	SREP	Threat cards	Messages	Monitoring	Parameters
Status <input type="text"/>									
<b>Environment</b>		<b>Corporate governance</b>		<b>Market presence</b>		<b>Business processes and capital</b>			
<b>Sectors</b>		<b>Exercising of ownership</b>		<b>Products</b>		<b>Financial and operational risks</b>			
<i>Rating</i>	Moderate	<i>Rating</i>	Adequate	<i>Rating</i>	Significant	<i>Rating</i>	Significant		
		<b>Strategy</b>		<b>Customers</b>		<b>Capital and earnings</b>			
		<i>Rating</i>	Adequate	<i>Rating</i>	Weak	<i>Rating</i>	Moderate		
		<b>Internal governance</b>		<b>Fraud management</b>					
		<i>Rating</i>	Weak	<i>Rating</i>	Adequate				
		<b>Internal control system</b>							
		<i>Rating</i>	Weak						
<b>Environment</b>		<b>Corporate governance</b>		<b>Market presence</b>		<b>Business processes and capital</b>			
		Adequate +		Weak +		Significant +			
<b>Aggregate rating:</b>						Significant			

Source: Hungarian Financial Supervisory Authority

Part of the risk-based supervisory process should therefore involve looking beyond institution-specific data to gather and analyse information on the industry and the financial system as a whole, including relevant international market information. The risk identification process should also be forward-looking in nature, in order to detect trends that may pose new or emerging risks. The supervisor must then distil this information and identify the risks of greatest concern. For example, a 20% concentration of the assets of the pension fund industry as a whole in a particular industry may represent a much greater risk to the financial system than would a 20% (or even higher) concentration in the asset portfolio of a single pension fund, meriting greater supervisory attention to how this risk is being managed.

#### When is systemic risk important?

Some pension supervisory authorities have to rely more on systemic risk analysis as they oversee too many entities to produce an in-depth risk-score for each one. Likewise, supervisory authorities covering more emerging pension systems may focus more on systemic risk as these are where their main challenges lie (see box).

### Systemic Risk in Emerging Economies

The importance of identifying systemic industry risks as well as individual institution risks needs particular emphasis in the context of emerging market countries. For example, it has been the experience of many newly established pension supervisory authorities to find that poor record-keeping and administration by pension funds is a systemic problem. The supervisory authority may choose to focus resources on finding an industry-wide solution to improving record-keeping (e.g. through training, issuing of model or mandatory management information system requirements, imposing a centralised administration system, etc) rather than devoting inspection resources to the record-keeping performances of individual pension funds and pursuing actions in a piecemeal fashion.

Systemic risks often arise when a supervisory system is first implemented or significantly strengthened. For example, there could be poor working practices on the part of service providers. The pension supervisory authority can work with industry groups to improve these. Likewise, training may be needed to get trustees up to speed, or to improve the quality of data used (e.g. actuarial assumptions). Pension supervisory authorities may work with professional organisations to gain information and improve standards.

Systemic risks also arise as a result of the change in the financial, economic and social environment, even if initial systemic issues have been resolved satisfactorily. Such changes naturally include a significant market correction outside the normal fluctuations of stock and bond markets. For example it can be difficult to immunise assets in emerging markets (due to a lack of instruments, investment restrictions etc.) and therefore pension supervisory authority needs to be vigilant regarding mismatch risk.

An important aspect of RBS is the need to understand the risk management and investment strategies of pension funds and the investment markets in which they operate. For example (as discussed in Module 1), a full range of investment grade securities is not readily available in some developing countries. The stock market may offer only a limited range of securities and be volatile. Foreign investment may be limited, so the large liquid and low cost (of transaction) markets in developed countries are not as accessible as they could be. This means that all portfolios would be considered high risk, due to the fact that portfolios have difficulty in accessing securities that would be more appropriate (for example many are probably overweight in property). This is a systemic risk, rather than a specific risk for each pension plan or fund.

Other changes to the socio-economic landscape are less dramatic and can often be planned for. Such changes could include improvements in public health and education which lead to an expectation of significant mortality improvement. Other social changes, such as greater acceptance of common-law spouses and/or same sex spouses, which could increase the cost of survivor benefits, also need to be monitored. Pension supervisory authorities need to ensure actuaries include such factors in assessing the costs and solvency of defined benefit pension plans, otherwise these costs will be underestimated. These phenomena also affect defined contribution pension plans as they reduce the amount of prospective benefit to all beneficiaries for a given amount of capital at retirement and so might cause a reappraisal of adequate contribution levels to meet reasonable expectations as to target replacement ratios.

While these types of issues are more likely to face pension supervisors in an emerging market country than in a developed financial system, a developed system with many small funds could present this type of problem as well. The consideration of such systemic issues therefore needs to be built into the risk

analysis of pension supervisory authorities overseeing such systems.

Systemic risk may also take on increased importance at particular times. For example, the financial and economic crisis of 2008/2009 highlighted the need to include systemic risk analysis into risk-based supervisory regimes by displaying the importance of monitoring 'contagion channels' (to use the IMF's phrase) between financial sectors and between the financial sector and the real economy.<sup>10</sup> Consequently, during this period Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) of Germany -for example - set up a special Task Force to deal with the crisis. Increased reporting requirements for risk, solvency, liquidity and liability coverage for major Institutions for Occupational Retirement Provision (IORPs) were set up, the frequency of reporting on investment and/or hidden reserves was increased from quarterly to monthly, and a type of regular liquidity monitoring was increased – all activities being designed to improve the ability of the supervisory authority to track developments within the sector and identify potential risks as soon as possible. BaFin paid attention to IORPs' investments in particular firms or products (Lehman, AIG, structured credit products, banking sector, Madoff), as well as to other investment risks which may not only affect the pension sector (including: exposure to countries with high CDS spreads; exposure to automotive industry; exposure to banks issuing covered bonds.)<sup>11</sup>

It may also be necessary to pay attention to functional activities or risk categories, which do not require immediate attention at the individual entity itself, but where the entity may form part of the benchmark for other entities. In such cases, an appropriate supervisory response might well be industry-wide in nature.

#### *How can systemic risk be identified?*

Examples of such systemic risk assessment include performing sector-wide risk analyses (*e.g.* stress-testing, focused surveys). Other assessments could include:

- Early-warning systems
- Assessment of macro economic conditions
- Market conditions
- Assessment of industry funding levels
- 3<sup>rd</sup> Party oversight
- Member complaints
- Examination of compliance with new legislation or regulation
- Industry wide practices, such as selection of actuarial assumptions and methods, or interest crediting policies for defined contribution plans

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<sup>10</sup> See (Impavido, Tower 2009)

<sup>11</sup> For examples of other countries responses to the financial crisis see IOPS Working Paper No. 9 (IOPS 2009)

### *How can systemic analysis be incorporated into overall risk assessments?*

Practical difficulties may arise when undertaking thematic analysis - including how to integrate such analysis into the assessment of individual institutions - one solution being to pre-populate score sheets with these factors. Developing systems for comparing risks across the whole of a supervisory authority's portfolio of firms is also not easy – with central databases, specific divisions and specialist staff usually required. In some cases, the supervisory authority may need to supplement its internal expertise in order to help identify risks or to more fully understand their importance. The supervisor should have the authority to retain external experts, as necessary (e.g. the supervisor may retain experts to provide advice on the potential risks in a new type of derivative instrument).

Pension supervisory authorities can incorporate systemic risk analysis into their overall risk assessment in different ways. Either they can build systemic risk considerations into the risk scores produced for the individual entities they are assessing (as is the case, for example with the Hungarian Financial Supervisory Authority or the Australian Prudential Regulation Authority) or systemic risk can be added as a further layer of analysis directing supervisory action after individual risk scores have been produced (as is the case with De Nederlandsche Bank's FTK model). Alternatively, systemic considerations will directly form a part of any 'probability' ratings where individual risk scores are not produced for all entities supervised (as is the case with the United Kingdom's Pensions Regulator).<sup>12</sup>

#### Example: Hungary



The Hungarian Financial Supervisory Authority (HFSA) in Hungary integrates both institutional and thematic analysis into their risk analysis framework. Thematic risks considered include political, regulatory and market/ product changes. As with institution specific risks, these are considered/ ranked in terms of importance /impact on the supervisor's objectives.

The HFSA usually test and assess thematic risks on a sample of institutions in order to draw conclusions for the universe of supervised entities. Depending on the results, further follow up investigations with a group of or specific individual institutions then takes place.

Thematic analysis is also fed into the organisation's electronic, risk assessment system which provides a risk score for each supervised institution. Sector and thematic risk pages can be viewed by the supervisors overseeing a specific institution, with some risk categories (which feed into the overall result) scored centrally by sectoral analysts.

In addition, analysis of the macroeconomic environment is used in the setting of the HFSA's risk policy and risk appetite, including stress tests and scenario analysis.

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<sup>12</sup> For a comparison of how different IOPS members handle systemic risk see Table 2 in Module 5

### Example: Australia



In Australia the Australian Prudential Regulation Authority (APRA) regularly reviews each industry it supervises and the general state of the macroeconomic environment for emerging issues and threats. These reviews may lead to actions relating to a specific regulated entity and/or lead to a revision of APRA's prudential requirements. Industry analysis provides supervisors with up-to-date information on industry developments and emerging issues or trends that may adversely impact regulated entities' risk profiles. Supervisors are responsible for developing an appropriate supervisory action plan to mitigate any risks or issues identified. Supervisory actions will vary by regulated entity and reflect APRA's risk-based approach.

On an annual basis, the internal Industry Groups consider and identify key emerging risks and supervisory issues for each industry with input from the frontline, technical, policy and statistics teams. These issues are aggregated into report form. A supplementary regular summary note is also prepared by Industry Groups for supervisors on a six monthly basis on the key supervisory issues within the industry and macroeconomic environment. The reports consider:

1. emerging or existing issues that have the potential to alter the risk profile of a category of regulated entities;
2. implications of the issue for regulated entities; and
3. key areas and triggers where specific supervisory action may be required.

The identified risks and issues are further distilled into a 'top risks and issues' list for each industry that must be considered in setting supervisory action plans for all regulated entities. Supervisors should assess the impact of identified issues on the regulated entities within their portfolio and incorporate actions, as necessary, to address the risks in supervisory action plans. Other teams (e.g. specialist risk, research and technical teams) also provide active support to supervisors. Each of the top risks and issues identified in the report is allocated to an individual determined by the Executive Group. This person is responsible for developing suggested supervisory actions to ensure the issue/risk is adequately addressed by supervisors in the upcoming year. With support from across APRA, the issue/risk 'owner' is responsible for:

1. developing suggested supervisory actions, with agreement from the relevant Industry Group; and
2. coordinating a group of staff from across APRA to ensure there are sufficient subject matter experts that are aware of developments in respect of the issue/risk. These staff are encouraged to:
  - facilitate communication across supervision and specialist teams on specific risk issues or concerns that are likely to affect desired supervisory outcomes;
  - work with key risk 'owners' to develop strategies for assessing and reporting on the top

risks/issues;

- provide specific assistance to other supervisors on issues related to their area of expertise;
- ensure relevant regulated entities' supervisory action plans adopt an issue/risk action;
- ensure staff receive adequate information, support and training on the issue/risk; and
- develop an aggregate report on the issue/risk by the end of the year, summarising the findings for the Executive Group and any recommendations arising from the year's work.

In addition to regular analysis of key industry risks and issues, *ad hoc* industry-based studies may also be conducted by Research, Statistics and other areas of APRA. These reviews will have a clear summary, for internal purposes, of how the concepts examined are relevant to supervision and areas supervisors should consider in their analysis and assessment. Peer group financial analysis and other analytical support tools are also used. A regular review of financial information is conducted by Statistics and used to identify key trends within an industry sector and outlier regulated entities. Outliers will be raised directly with supervisory teams to review and potentially raise issues with the regulated entity.

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