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IOPS RISK-BASED SUPERVISION TOOLKIT

MODULE 4

ASSESSING RISK

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Introductory note

The **IOPS Risk-based supervision toolkit** provides a 5-module framework for pensions supervisors looking to apply or enhance 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 [https://one-communities.oecd.org/community/iops/SitePages/RBS-Toolkit\(1\).aspx](https://one-communities.oecd.org/community/iops/SitePages/RBS-Toolkit(1).aspx)

This document contains the guidance for **Module 4: Risk Assessment**

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I. INTRODUCTION



Figure 1: RBS Cycle

Source: IOPS Secretariat

Risk-based supervision (RBS) is a structured approach which focuses on the early identification of potential risks faced by pension plans or funds¹ and the assessment of the financial and operational factors in place to minimise and mitigate those risks.

This process then allows the supervisory authority² to direct its resources towards the issues and institutions which pose the greatest threat thereby supporting timely action and escalation where determined necessary.

A. Purposes

Having identified the major risks to meeting its supervisory objectives (see Module 3 of the IOPS Toolkit), the pension supervisory authority needs to assess these risks. This includes considering possible mitigants and controls so that risk may be assessed on a *net* as well as a *gross* basis. The authority then needs to establish a method for weighting these risks, according to the probability of their occurrence and their importance and impact on the goals of the supervisory authority – i.e. a risk-scoring model has to be devised.

Risk-scoring models should reflect the risk-focus of the pension supervisory authority and account for the nature of the pension system, the supervisor authority's risk appetite as well as its resources and capacity (see Module 3 of the IOPS Toolkit). For some pension supervisory authorities this will mean deriving individual risk-scores for the entities which they oversee. However, it may not be feasible for some supervisory authorities to derive an individualised risk score for every single supervised entity – particularly

¹ 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 2016/2341/EC of the European Parliament and of the Council of 14 December 2016 on the activities and supervision of institutions for occupational retirement provision \(IORPs\)](#), e.g. pensions funded via book reserves (c.f. art. 2 of the Directive).

² 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.

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in pension systems where many thousands of funds operate. In such cases, supervised entities may be categorised in a simplified way – usually in terms of their size or impact of failure– with the funds which have the greatest ‘impact’ receiving the greatest supervisory attention (as described in Module 5 of the IOPS Toolkit)³.

Where the risk model derives individual risk-scores for each entity under supervision, they can help supervisory authorities devise an efficient, proportional, consistent and truly risk-based approach. Their purpose is to integrate qualitative and quantitative factors, to help identify areas for attention by institutions and to help establish supervisory priorities. The danger, and difficulty, with such models is to allow for sufficient individual judgement in their use, and to stop them becoming simply ‘box ticking’ exercises. A balance needs to be struck between designing a system which is sufficiently complex to be able to capture and assess a wide range of risks at the firm specific and generic level and which can operate across a widely varying regulated population, and yet be simple enough to be understood and used on a day-to-day basis by supervisors.

As the individual country case studies provided in the IOPS RBS Toolkit show, many supervisory authorities around the world have developed their own risk-scoring models. Clearly others can learn from these, but a fundamental lesson learnt by IOPS members is that one model or structure cannot be taken from one country and applied unaltered to another pension system⁴. All countries are unique, with models requiring adaptation to each situation. The message from IOPS members is to look widely and decide what would be appropriate for the individual pension system before trying to adopt one model.⁵

A further lesson stressed by IOPS members is that any model, once built, should not be considered as fixed in stone. This lesson was reinforced in the RBS learnings project (2021-2022) where it was observed that several early adopters have made significant changes to their RBS risk models. For example, one of the pioneers in risk-based supervision, the Australian Prudential Regulation Authority (APRA) of Australia, has recently replaced its risk scoring system (Probability and Impact Rating System known as PAIRS) with a new risk model: Supervision Risk and Intensity (SRI) model⁶. Similarly, another pioneer in risk-based supervision, the Netherlands, has also significantly revised its approach⁷ and introduced its third risk model since first commencing use of RBS.

There are also several lessons learned from implementing or changing a risk scoring system⁸. Firstly, time is needed to fully embed the system and to prepare and support supervisors. One structural mistake commonly made by early adopters was rolling out a new system live to all funds at the same time. Now, new

³ As noted in the Introduction to the IOPS RBS Toolkit, risk-based supervision can sometimes be confused with these individual risk-scoring models – indeed it can be thought that risk-based supervision *is* simply such a risk-scoring model. However – as the IOPS RBS Toolkit strives to show – RBS is a much broader philosophy or approach which can be implemented even when detailed analysis on each individual institution is not feasible.

⁴ IOPS (2007b), [Experience and Challenges in Introducing Risk-based Supervision for Pension Funds](#), IOPS Working Paper No. 4

⁵ Trying to adapt an ‘intra-country’ model may be just as difficult, due to differences between sectors. For example, the Pensions Regulator (TPR) in the United Kingdom started by adapting an approach from the United Kingdom’s Financial Services Authority. However, it quickly became apparent that this would not work for TPR as it would not be practical to score each of the thousands of pension plans in the United Kingdom individually.

⁶ [Supervision Risk and Intensity \(SRI\) Model | APRA](#)

⁷ [Brochure ATM \(dnb.nl\)](#)

⁸ See Module 1 for learnings from implementing or changing an RBS approach 1.

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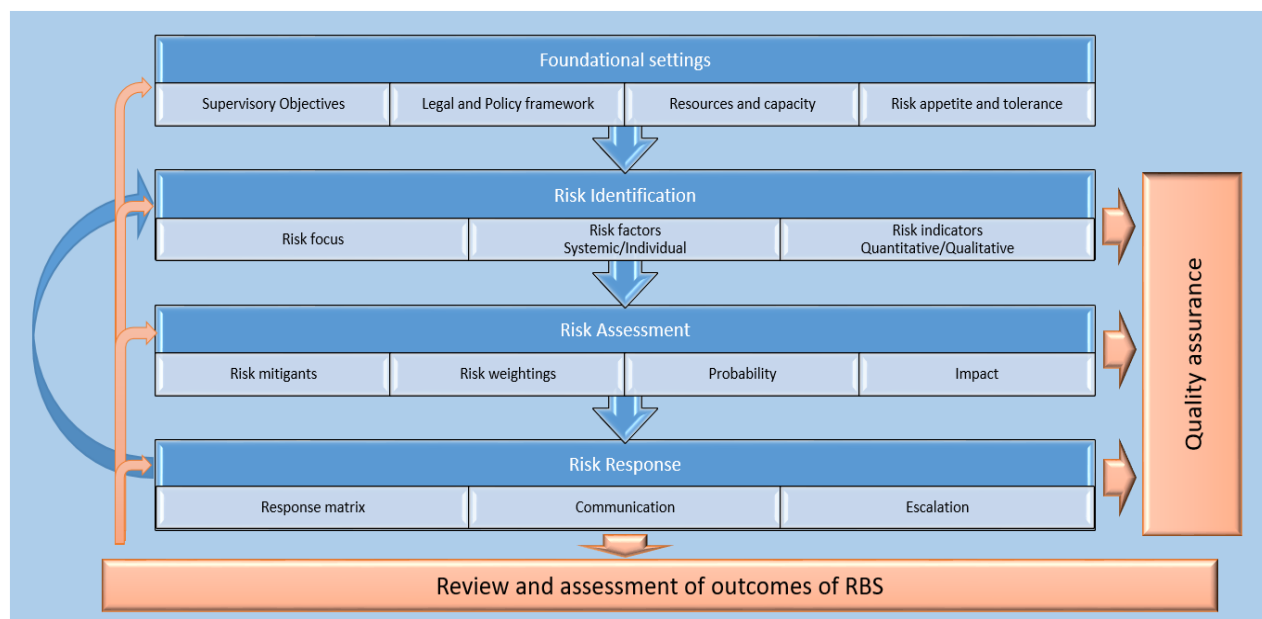
or significantly revised systems are often introduced via a ‘pilot’ project with a few funds. The purpose is to test the various elements such as data collection, application of guidance for assessing risks, the outputs of the risk model, administrative issues, as well as internal staff capability etc.

APRA’s message is also to think ‘increment and evolution’ – “get it as right as possible, give it time to embed and expect to make changes in the future.”

APRA also suggests that an assessment should be made as to whether the system needs to be different for different categories/classes of funds. Their new SRI Model has different risk categories applicable to entities with differing impact to align with the varying depth of analysis undertaken in respect to each group.

This Module 4 of the IOPS Toolkit is designed to help supervisory authorities who wish to build a risk-scoring model which will be used to guide their supervisory actions. Risk mitigants are first discussed, to help supervisors consider risk on a net basis. The Module then goes on to consider how to weight the components of risk scoring models in order to devise a final score and how to check for consistency in such scores.

Figure 2: Risk-based Supervision Process



Source: IOPS Secretariat

B. Principles and Guidelines

This Module 4 of the IOPS Toolkit builds on the *IOPS Principles of Private Pension Supervision*.⁹

Principle 5: Risk-based Supervision

Pension supervisory authorities 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.

5.9 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.

⁹ See IOPS (2010), [IOPS Principles of Private Pension Supervision](#).

SECTION 1: RISK MITIGANTS

A. Risk Mitigants

Many risks can be effectively controlled or reduced to acceptable levels. Consequently, in addition to risk factors (which are discussed in Module 3 of the IOPS Toolkit), to have a truly risk-based approach supervisors need to also look at mitigating factors which lower these risks – i.e. they analyse risk on a *net* basis.

Figure 2: Example of Net Risk Scoring

Net Risk				
Quality of Risk Management for Significant Activity	Level of Inherent Risk for Significant Activity			
	Low	Moderate	Above Average	High
Strong	Low	Low	Moderate	Above Average
Acceptable	Low	Moderate	Above Average	High
Needs Improvement	Moderate	Above Average	High	High
Weak	Above Average	High	High	High

Source: Toronto Centre

Figure 3: Example of a Risk Matrix

Risk Matrix					
RISK MATRIX					
Significant Activities	Materiality	Inherent Risks	Quality of Risk Management	Net Risk	Direction Of Risk
Activity 1	★	<input type="checkbox"/> Credit <input type="checkbox"/> Market <input type="checkbox"/> Liquidity <input type="checkbox"/> Insurance <input type="checkbox"/> Operational <input type="checkbox"/> Legal & Regulatory <input type="checkbox"/> Strategic	Operational Management <input type="checkbox"/> Oversight <input type="checkbox"/> Financial Analysis <input type="checkbox"/> Compliance <input type="checkbox"/> Internal Audit <input type="checkbox"/> Risk Management <input type="checkbox"/> Senior Management <input type="checkbox"/> Board Oversight	★	
Activity 2					
Etc....					
Overall Rating			Overall Assessment		
Capital		Earnings			
Composite Risk	★	Direction of Risk	Time Frame		

Source: Toronto Centre

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Risks can be managed in a variety of ways. While governance risk has been included as a risk factor by a growing number of jurisdictions, good governance is also recognised as a key risk mitigant. Other mitigants include a capable senior management team, an effective risk management framework that includes well-documented and effective policies and procedures, strong internal controls, an independent internal audit function (or equivalent services provided by an audit firm), effective risk management processes, strong actuarial and financial analysis capabilities, and comprehensive external audits. Some risks may be managed financially, e.g. through imposing capital requirements or using compensation funds, using reinsurance, hedging or securitisation.¹⁰

In some areas, it can be difficult to identify the differences between a risk and a control –with financial regulators in particular encountering this problem especially in periods of financial crisis. For example, some may see derivatives as control mechanisms (to hedge current or interest rate risk, for example) – whereas others could view these contracts as risks in themselves. Indeed, the danger that some techniques used to mitigate one type of risk can themselves create other types of risk. Therefore, the interrelationships should carefully be considered. See Black (2008, page 30).

The main mitigating factors that supervisory authorities may wish to consider are set out in Table 1 below. It should be noted that not all factors listed below will be relevant for all types of pension systems and that different approaches may see mitigating factors reflected in different ways.

¹⁰ For example, in Hong Kong, China, trustees of Mandatory Provident Fund (MPF) schemes are required to satisfy minimum capital adequacy requirement and to take out adequate insurance to indemnify scheme members against any loss of scheme assets caused by misfeasance or misconduct of the trustees or their service providers. There is also a Compensation Fund set up under the Mandatory Provident Fund Schemes Ordinance to compensate scheme members should the indemnity insurance be insufficient to fully cover those losses. The government has injected HK\$600m as seed money into the Compensation Fund, and a Compensation Fund levy (subject to an automatic triggering mechanism) is payable by MPF trustees. When in need, the Mandatory Provident Fund Schemes Authority may apply to the courts to make use of the Compensation Fund.

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Table 1: Risk Mitigants¹¹

Mitigant		Description
<p>Governance</p> <p>Effective governance will ensure that the decision makers of the pension fund are empowered and able to make decisions that promote the interests of members and beneficiaries</p> <p>As the quality of governance can have both a positive and negative impact, it can be perceived as both a risk and a mitigant.</p>	Board/ Trustees	<p>Covers their understanding of responsibilities, their experience, competence and integrity as well as the presence, management and avoidance of conflicts of interest. If there are concerns about the fitness and probity of those in control, this would increase the risk score.</p> <p>The degree of trustee oversight is also key; meaning overall fund governance, and in particular the strategic direction of the fund, as well as the relationship between the fund (or plan) sponsor, fund management and the board or trustees. The governing board/trustees' awareness of the culture within the pension fund's operations and how the culture may influence day to day decisions may also be an indicator of their effectiveness at mitigating risk.</p> <p>There is a degree of subjectivity in rating this factor particularly on a forward-looking basis. Negative scores might be recorded if filings are late and/or incomplete, or if the plan does not fully cooperate with the pension supervisory authority. Lack of proper control and oversight and lack of proper documentation would also increase the score. In-depth inspections and/or targeted discussions with the board/trustees would deepen the analysis of this factor. Self-assessments and surveys are also being utilised to inform such assessments.</p>
	Management	<p>Management own and manage the risks of the pension fund on a day-to-day basis. They are sometimes referred to as the 'first line of defence'. In essence, the assessment of this factor focusses on determining if managers understand, and are effective in managing, the risks of the pension fund.</p> <p>An assessment of management as a risk mitigant will generally include consideration of management quality and structure, their decision-making processes, strategic planning and risk control attitude.</p> <p>Management should be accountable and enable mitigation of inherent risk through a management structure and composition in line with the volume, scope and complexity of the business, with clear and comprehensive allocation of responsibilities and adequate management oversight and control. They should foster a culture of risk and control awareness and conduct themselves with integrity, due skill and diligence.</p>
	Risk culture	<p>Reflects the influence of an organisation's culture on how risks are managed¹². It includes the norms of behaviour for individuals and groups associated with the operations of the pension fund that determine the collective ability to identify and understand, openly discuss and act on the pension fund's current and future risks and that support the fund operating</p>

¹¹ Source IOPS Secretariat and collated based on examples and material gathered from jurisdiction case studies including those provided by Australia, the Netherlands, North Macedonia, Kenya and Chile as well as material contained in the previous version of RBS Toolkit.

¹² [information-paper-risk-culture1.pdf \(apra.gov.au\)](#)

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Mitigant		Description
		within its own risk appetite. Lack of cooperation discovered during on-site inspections, for example, may be an indication of poor culture and warrant consideration when risk scoring.
Risk Management Considers how the pension fund's risks are managed and controlled. It includes consideration of the risk management framework and supporting infrastructure.	Risk Management Framework	<p>The risk management framework encompasses all of the strategies, systems, structures, policies (including human resource, investment, compliance, claims management and operational risk management policies) procedures and controls to effectively identify, manage, monitor and mitigate the risks to the pension fund, its members and beneficiaries.</p> <p>The risk management framework should be fully embedded and appropriate for the size, nature and complexity of the fund. There should be an effective control environment with reliable and timely data to support escalation of matters to senior management and Board/trustees where appropriate.</p> <p>Breaches of legislative obligations may be an indicator of an ineffective management and control environment. If there are outstanding complaints due to breakdowns in processes, this could add a further amount to the risk score.</p>
	Strategic Planning	<p>Includes consideration of the planning processes to develop the pension funds' strategy and business plan. There should be:</p> <ul style="list-style-type: none"> • a strong connection between strategy and risk planning ensuring that the planning processes include consideration of the risks arising from the strategy and plan and how these will be mitigated. • realistic strategic objectives that are specific and measurable, • well considered plans; and • appropriate mechanisms in place to review and assess the performance of the business model and the strategic plans for achieving the strategic objectives.
	Risk Management Strategy	<p>Consideration should be given to whether the:</p> <ul style="list-style-type: none"> • board/trustees (or other governing body) articulated a risk-management strategy that identifies risk, sets parameters and measures, monitors and controls for identified risks and • risk management strategy is being applied effectively and updated regularly. <p>The risk management strategy's alignment with the business or institutional strategic plan should also be considered and there should be a suitably robust model for risk assessment used (with reliable, up-to-date, independent assumptions and data used etc.)</p>

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Mitigant		Description
	Investment strategy ¹³	<p>The investment strategy and related policies and procedures set out the management of investment risk and will generally give consideration to the following:</p> <ul style="list-style-type: none"> • Investment objectives • Asset allocation • Diversification • Liquidity needs • Valuation methodology / Pricing • Use and monitoring of derivatives¹⁴ • ALM targets (where appropriate) • Performance measurement, monitoring and benchmarking • Control procedures, including risk analysis/ risk tolerances / risk monitoring • Reporting format and frequency • ESG Factors¹⁵ <p>Where appropriate, consideration should also be given to the suitability of investment choices, including a default fund, offered to members.</p>
	Information, Reporting and Communication	<p>Incorporates consideration of the quality, relevance and timeliness of information and reporting. It includes consideration of communication within the organisation and to the governing board/trustees. Capacity to produce timely and reliable information for regulators and members should also be considered. Management information systems should be appropriate for the size, volume and complexity of the pension fund and reports generated should provide a sound basis for decision making.</p> <p>Adequate strategies and recovery plans should be in place to support resilience in IT systems, information security¹⁶ and data management. Similarly, there should be adequate controls to ensure appropriate record keeping and data quality. There should also be mechanisms in place to protect confidential information. Lack of completion (or unsatisfactory completion) of questionnaires, interrogatories, or the like, may be indicators of a concern. Unsatisfactory or late filings might also suggest, among other things, that there is issue with the pension fund's reporting or information management.</p>

¹³ See also IOPS (2017b), [Supervision of pension investment management including non-traditional investment](#), IOPS Working Paper No. 29 and IOPS (2021b), [Supervision of Infrastructure investments by pension funds](#), Working Paper No. 36.

¹⁴ See OECD/IOPS (2011), [Good Practices On Pension Funds' Use Of Alternative Investments And Derivatives](#) for further details.

¹⁵ See IOPS (2019), [Supervisory Guidelines on the Integration of ESG Factors in the Investment and Risk Management of Pension Funds](#) for further details

¹⁶ See IOPS (2021a), [Supervisory approaches to enhancing cyber resilience in the private pension sector: High-level summary of Members responses to the questionnaire](#), Working Paper No. 37 for further details.

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Mitigant		Description
	Use of service providers/outsourcing ¹⁷	Where an administrator or other key service provider, has a proven track record, this might mitigate some of the risk factors identified. Consideration should be given to how the service/outsourcing arrangements are monitored, the specific terms of the contracts and what controls are actually in place to decide whether they are likely to be effective in mitigating specific types of risk in future.
	Risk and compliance functions	<p>The risk and compliance functions provide independent oversight and challenge and play an important role in ensuring that risks are identified and controlled and managed within appropriate boundaries.</p> <p>Consideration should be given to the resourcing, integrity and independence of responsible staff within the risk and compliance functions. There should be evidence of the functions effectively monitoring risks and they should have sufficient standing and authority to provide effective challenge to decision makers.</p> <p>Concerns may arise if it is observed that the risk and compliance functions are not adequately resourced or given appropriate access to the business operations, board or management.</p>
	Assurance	<p>Reliable independent review will give the pension supervisory authority greater confidence in the administration, funding and investment of the pension plan. Therefore, it should consider the independence and competence of those providing assurances (such as the actuary, independent custodian councils and the internal and/or external auditors as well as the quality of their reports.</p> <p>If the actuary is an employee of the sponsor, this would add a component to the risk score, although this is not necessarily a strong negative if such actuary demonstrates independence. If there are any other concerns about the professionals (for example, not members in good standing in the respective national or international professional bodies), then a further risk score would be added. If reports are difficult to follow, are not well prepared or have qualifications, an additional risk score would be added.</p> <p>An effective audit function is important to ensuring that the pension fund's internal controls, risk management and governance systems operate effectively while also providing important assurance around financial reporting and associated controls. Therefore, it is important that they are appropriately independent, free of conflicts and have the necessary access to the pension fund's management and board.</p>

¹⁷ See IOPS (2012), [Supervision of Pension Intermediaries](#), Working Paper No. 17 for further details.

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Mitigant		Description
<p>Financial resources and support</p> <p>Consideration and assessment of the financial resources to support a pension fund will vary depending on the nature of the pension fund.</p> <p>For defined contribution (DC) funds, financial resources should be adequate to ensure the effective operation of the fund and the ability to withstand unexpected losses so as to reduce the risks to members.</p> <p>Defined benefit (DB) funds (and defined contribution funds which offer guarantees) with higher levels of financial reserves are more likely to be able to pay promised pension benefits. The level of these reserves can, therefore, be considered as a risk mitigant (protecting against the ultimate risk of not receiving promised or expected retirement income). The results of quantitative risk assessment, therefore, feed into the overall risk assessment by way of mitigating considerations¹⁸.</p>	Sponsor:	<p>The fund sponsor is a key source of financial resources. In the case of a DB fund, it is important to understand the fund sponsor/employer's financial position as well as their contractual and legislative obligations to the pension fund in order to ascertain the extent to which the employer sponsor may be relied upon to meet their contribution requirements and, where required, cover any deficit¹⁹.</p> <p>Where sponsorship arrangements exist for defined contribution funds, it is equally important to understand the contractual arrangements and whether the sponsor can meet their ongoing future financial obligations to the fund noting that, should they fail to provide the agreed resources, the costs of those resources could fall on the members and beneficiaries of the fund.</p>
	Insurance	<p>Consideration may be given to the adequacy of any insurance reserves maintained for the fund as well as insurance arrangements (such as indemnity insurance or cyber insurance). Consideration may also be given to any underwriting and claims management arrangements.</p>

¹⁸ See Module 2 for details regarding quantitative risk assessments.

¹⁹ There are some jurisdictions where the employer is not responsible for any funding deficit. See IOPS (2021, pages 8 and 10). [Supervision of solvency of occupational DB pension funds in the current financial environment](#), IOPS Working Paper No. 35.

Just as risks need to be considered on a systemic basis (as discussed in Module 3 of the IOPS Toolkit), risks can also be mitigated on a system-wide basis. For example, if longevity risk is a particular concern, this can be mitigated by including increases in life-expectancy in the assessment of pension liabilities. Where the governance of pension funds is found to be a system-wide risk, this can be mitigated by focusing on pension fund trustee or fiduciary knowledge and understanding. As system-wide risks will often be mitigated by supervisory responses and interventions, the issue is discussed in further detail in Module 5 of the IOPS Toolkit.

Not all potential risk management tools – financial or non-financial –are equally applicable or effective in managing each type of risk. Accordingly, before attempting to assess a pension fund’s management of its risks, the supervisor must not only have a clear understanding of these risks but also know which risk management tools are most relevant to each.

Industry benchmarking and thematic reviews can be useful in identifying best practices and establishing assessment criteria that the supervisory staff can use. For example, in order to assess the contribution of internal audit, the supervisor should know the characteristics of a good internal audit function – such as its responsibilities, authority, reporting relationships, staff capabilities and methodology. Although assessment against these criteria would seem to lend itself well to a checklist approach, the supervisor must nevertheless apply judgment during this process.

Where a fund has outsourced its operations, and if the operations relate to the pension business, the supervisor needs to assess the systems of the external parties. The supervisor needs also to evaluate the protections that the pension fund has under its contracts with these parties, as the governing board of the pension fund has the ultimate liability for any shortcomings out of the outsourced operation. Supervisory reviews should include the right to directly address and request information from a pension fund’s service providers - or the pension supervisory authority should have mechanisms in place for liaising with other financial service authorities in order to do so.²⁰

B. Assessing a pension fund’s risk management

Each financial institution's particular approach to risk management will vary with the size and nature of its business, along with the stage of development of the markets in which it operates. Risk-based supervision can be successfully implemented even in jurisdictions where the financial institutions themselves may not be employing sophisticated risk management techniques – though greater supervisory oversight and other risk control measures (such as quantitative investment rules) may still be required where this is the case. Whatever the situation, it is essential that supervisory assessments consider not only the existence of policies, procedures and controls, but also their effectiveness as risk management tools.

As explained in Module 1 of the IOPS Toolkit, the supervisory authority may wish to provide guidance to supervised entities on the risk management systems and other forms of mitigants they would expect to see. Indeed, again as discussed in Module 1 of the IOPS Toolkit, providing such guidance to overseen entities is an important element in RBS, which may be new and have to be developed by supervisory authorities adopting this approach. In this way, risk can be managed on a systemic as well as an individual basis as supervisors aim to improve the risk-management at all funds rather than requiring improvements with an individual fund’s risk-management.

²⁰ For further details, see IOPS (2010b), [Managing and Supervising Risk in Defined Contribution Pension Systems](#), Working Paper No. 12.

Some supervisory authorities (for example Comisión Nacional del Sistema de Ahorro para el Retiro (CONSAR) in Mexico) still impose strict regulatory requirements on the risk-management framework of pension funds. However, others take a more ‘prudential’ approach, providing more general guidance²¹. In the United Kingdom, for example, governing bodies of pension schemes are required to ensure that they have an effective governing system, including internal controls. To support governing bodies to meet this requirement, the Pensions Regulator is currently debating a code of practice that will set out the expectations of trustees and provide guidance on the risk management and specific controls that should be in place (see The Pensions Regulator, 2024).²²

Under a risk-based approach, it is important that supervisors not only assess the effectiveness of the overall system of internal controls, but also evaluate the controls over high-risk areas (e.g. areas with characteristics such as unusual profitability, rapid growth, geographic remoteness from the head office, new, complex, unregulated or leveraged investment products etc.). Supervisors, in evaluating the internal control systems, may choose to direct special attention to activities or situations that historically have been associated with internal control breakdowns leading to substantial losses. Certain changes in the environment should be the subject of special consideration to see whether accompanying revisions are needed in the internal control system – such as a changed operating environment; new personnel; new or revamped information systems; new technology; asset allocation to new types of investment vehicles, etc. Where such risks are assessed as being systemic, such checks would be carried out on a system-wide basis (to ensure that risk is being measured and mitigated at the industry-wide as well as the individual pension fund level – see Module 3 of the IOPS Toolkit).

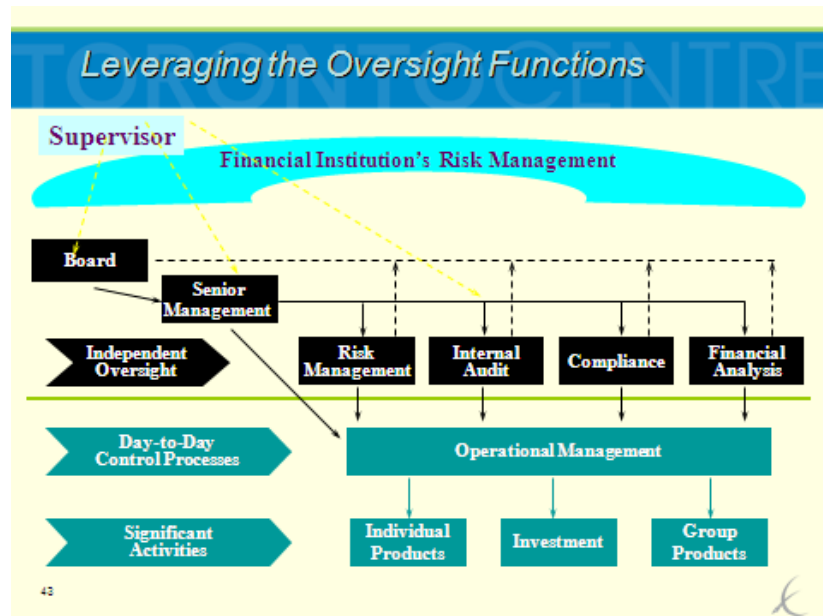
In those instances where supervisors determine that the risk management framework or components thereof such as the internal controls, are not adequate or effective for the organisation’s specific risk profile, they should take appropriate action. This would involve communicating their concerns to the governing board of the pension fund and monitoring the actions taken to address the concern. Where the risk was felt to be systemic and applying broadly across pension funds, the supervisory authority may react by issuing guidance notes on how they would expect risk management systems to be improved. Other mechanisms for evaluating the effectiveness of an entity’s risk management and internal controls include using the internal audit; via a process of self-assessment; using external audit services; through off-site or on-site reviews, and by undertaking a walk through or dummy transactions during an on-site inspection.²³

²¹ See some examples of requirements with regard to pension funds’ investment and risk management policies in IOPS (2017b) [Supervision of pension investment management including non-traditional investment](#), IOPS Working Paper No 29.

²² For examples of guidance provided by the Australian and German authorities see APRA (2004) and BaFin (2009). The United Kingdom is to introduce a new code of practice (see TPR, forthcoming in 2024). Further examples of such guidance are provided in IOPS (2009), [Pension Funds' Risk-management Framework](#), Working Paper No. 11.

²³ See Module 2 for more details on supervisory activities.

Figure 4: Relationship between Supervisory Authority and Pension Fund's Risk Management



Source: Toronto Centre ¹

Note: ¹ *Implementing Risk-based Supervision: Leadership and Management Challenges* - presentation given by Michael Hafeman, Regional Insurance Leadership Program, April 19-24, 2009, Johannesburg, South Africa

Example: Republic of North Macedonia



The mission of the Agency for Supervision of Fully Funded Pension Insurance (MAPAS) is to protect the interests of the members and the retired members of the pension funds and enhance the development of the fully funded pension insurance for safer retirement days. As part of its risk-based supervisory approach it categorises risk mitigation into two broad categories:

- the control procedures, internal controls, that are specific to a particular risk or group of risks, which can be assessed in the context of those risks and;
- the governance of entities which should ensure that decisions take proper account of risks and that control procedures are effectively monitored and remedial actions taken promptly.

In addition to governance and risk management, the mitigation of risks within the following categories is supervised:

- management quality and structure in terms of competence of management and characteristics of structure of top and middle management;
- clarity of corporate strategy/direction and the team considers the extent to which the Board has and communicates a strategy for the entity that gives the organization direction;
- quality of the control framework and the team of control considers the attitude of the Board to the management of the control framework needed to manage risk, and the overall effectiveness of that framework;
- risk management in terms of the quality of the risk management function and process in enabling the Board to understand and manage the risks to the pension company and pension fund;
- the propriety and transparency of decision-making and the team considers the decision-making process within the entity, especially its propriety and transparency²⁴.

²⁴ IOPS (2019), [Republic of North Macedonia Case Study 2019](#)

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Table 2: Regulatory Requirements for Risk-Management Architecture

	Risk management strategy	Board committees for risk management	Minimum participation in board committees	Centralised risk management function	Reporting obligations of chief risk officer (CRO)	Relationship of CRO with other functions	Compliance Officer
Netherlands	Required to be included in the business plan submitted at time of licensing	Accountability body that inter alia reviews long-term risk management	No specific requirements	Must be independent of all other departments in the pension fund	No specific requirements	No specific requirements	No specific requirements
Australia	Required for licensing and on an on-going basis; Complexity and detail depend on the size of fund	No specific requirements	No specific requirements	Must have a designated risk management function	No specific obligation for CRO but obligations in place for risk function. ²⁵	No specific requirement for CRO but obligations in place for risk function. ²⁶	No specific requirements
Mexico	Written policies and procedures for addressing op + and financial risk	Two board committees for op + and financial risk	Min 5 Board committee members ²⁷ ; independent/CEO/CRO	Central risk management unit (UAIR) – CRO heads ¹	To CEO, board and supervisor	Specified in detail	Compliance officer required

Source: World Bank publication, (Bruner, Hinz, Rocha, (2008)), 'Risk-based Supervision of Pension Funds: Emerging Practices and Challenges', Updated by IOPS Secretariat 2022

²⁵ The risk function must have the necessary authority and reporting structure to the Board, board committees and senior management to conduct its risk management activities in an effective and independent manner ([sps 220 risk management december 2018 1.pdf \(apra.gov.au\)](#)).

²⁶ The risk function must have access to all aspects of the RSE licensee's business operations that have the potential to generate material risk, including information technology systems and systems development resources ([sps 220 risk management december 2018 1.pdf \(apra.gov.au\)](#)).

²⁷ Deals with operational and financial risks.

SECTION 2: WEIGHTING RISKS- PROBABILITY AND IMPACT

Once the pension supervisory authority has established its risk focus (based on its objectives and resources), and has identified individual entity and systemic risks on a net basis (i.e. taking risk controls and mitigants into account), the authority then has to establish a methodology for weighting these risks. This involves establishing the probability of an adverse event and its likely impact. Quantitative and qualitative assessments will form part of the supervisor’s judgement.

A. Weightings

An important aspect of the design of a risk-scoring model is the weighting assigned to different risk categories and controls. This will partly be driven by the nature of the pension system. For example, operational or legal risks may be more challenging in less developed pension systems, causing the weightings of these factors to be raised. In addition, supervisors will weight risk categories differently according to whether they are overseeing DB or DC funds.

Example: Canada



The Office of the Superintendent of Financial Institutions (OSFI) in Canada begins its risk assessment process with a review of the significant activities of a pension plan, which are broken down into four categories:

- *Administration*
- *Communication to Members*
- *Actuarial*
- *Asset Management*

For most federally regulated DB plans, the *Asset Management Significant Activity* will have a high impact on the Overall Net Risk rating (more so than for DC plans), and within this activity the demographic and /or liability profile are of particular importance. Likewise, the *Actuarial Significant Activity* does not apply to DC plans, but is a major driver for DB ones. The *Communications to Members Activity* receives greater weighting under DC plans.

The risk matrix below indicates how identified risks impact plan members and beneficiaries, sponsors and others in various pension systems.²⁸ Who bears the risk will impact on the importance of the risk to the supervisory authority and the subsequent weighting of the category within the overall risk assessment.

²⁸ It should be noted that the matrix assumes a “going concern” situation, in other words, pension funds terminating with unfunded liabilities or pension accumulation funds becoming insolvent are not taken into account. In those instances, many of the risks nominally borne by the plan sponsor or the pension accumulation fund will inevitably fall on the member. Pension guaranty funds and risks that might fall on them in the event of failure of a defined benefit plan are also not considered here.

Table 3: Impacts of Risks of Different Parties

Risk	Traditional Occupational defined benefit plans²⁹	Occupational defined contribution plans	Personal, Individual defined contribution accounts
<i>Investment or market risk</i>	Borne by plan sponsor	Borne by plan member	Borne by plan member
<i>Counterparty default risk</i>	Not generally applicable, unless derivatives being used (e.g. for liability driven investments), in which case borne by plan sponsor	Not generally applicable (unless derivatives are being used)	Not generally applicable (unless derivatives are being used)
<i>Funding and solvency risk</i>	Borne by plan sponsor	Not applicable (unless DC plan offers guarantees in which case sponsor)	Not applicable (unless DC plan offers guarantees in which case provider)
<i>Liquidity Risk</i>	Most investments in marketable securities, so not usually significant risk, but in any event borne by plan sponsor	Borne by plan member, if adverse liquidity conditions create pay-out problems	Borne by plan member, if adverse liquidity conditions create pay-out problems
<i>Mismatch risks</i>	Borne by plan sponsor	Not applicable (except that inappropriate investment profile might result in lower than expected replacement ratio, but this is “soft” risk)	Not applicable (except that inappropriate investment profile might result in lower than expected replacement ratio, but this is “soft” risk)
<i>Actuarial Risk</i>	Borne by plan sponsor	Borne by plan member, but in individual rather than collective fashion (e.g. longevity risk, risk of outliving accumulation for scheduled draw-down pay-outs) If guarantees, borne by plan provider	Borne by plan member, but in individual rather than collective fashion (e.g. longevity risk, risk of outliving accumulation for scheduled draw-down pay-outs) If guarantees, borne by plan provider
<i>Agency Risk</i>	Borne by plan sponsor	Borne by plan member	Borne by plan member
<i>Operational Risk</i>	Borne by plan sponsor	In principle borne by pension provider (e.g. insurance company if one is involved), but if trust fund could fall on plan member	Borne by plan member
<i>IT Risk</i>	Borne by plan sponsor	In principle borne by pension provider (e.g. insurance company if one is involved), but if	Borne by plan member

²⁹ In traditional DB pension plans, the plan sponsor will be responsible for funding any plan deficit and thereby bears most risks. However, where that is not the case, the risk may be shared with, or borne by the Member. See IOPS (2021c), [Supervision of Solvency of Occupational DB Pension Funds](#), Working Paper No. 35 for more details.

Risk	Traditional Occupational defined benefit plans²⁹	Occupational defined contribution plans	Personal, Individual defined contribution accounts
		trust fund could fall on plan member	
<i>External and strategic risk</i>	Generally borne by plan sponsor, but some external risks (such as inflation in non-indexed plan) could fall on plan member	In principle borne by pension provider (e.g. insurance company if one is involved), but if trust fund could fall on plan member	Borne by plan member
<i>Legal and Regulatory Risk</i>	Borne by plan sponsor	Borne by plan member	Borne by plan member
<i>Contagion and related party/integrity risk</i>	Borne by plan sponsor	Generally not applicable, but might be some disruption to plan member benefits if pension provider gets into trouble	Borne by plan member
<i>Governance risk</i>	Borne by plan sponsor	Borne by plan member	Borne by plan member

Supervisors may wish to consider that risk factors with a directly measurable financial consequence should be weighted more heavily (e.g. the funding level in a defined benefit plan could be more critical than the plan's failure to submit a statutory return on time).

In addition, the weightings of the different risk categories and mitigants will need to be adjusted according to the nature, scale and complexity of the entity's risk being assessed. For example, a retail fund that is part of a diversified financial group and relies heavily on the rest of the group for outsourcing, may justify raised weightings in the contagion and related party risk categories. Likewise, operating risk may feature highly where a fund is growing fast. Investment risk should be a specific area of concern for supervisors where exposure to risky assets (particularly those that are leveraged and/or unregulated such as hedge funds) is high.

Example: The Netherlands



The Dutch Central Bank's (De Nederlandsche Bank (DNB)) risk model uses templates for different types of institution, including three templates for pension funds:

- pension funds which have been fully re-insured;
- pension funds which outsource nearly all their business;
- others – subdivided into pension funds that perform all functions internally and those which outsource asset management only.

The central model management team develops templates for each type of institution, assigning standard default weights denoting the importance of the different functional activities, and pre-programming risk profiles which assign default scores to the risk categories and controls. Models for the automated risk scoring make the same distinction.

Factors external to the pension fund may also have an influence on how different risks are weighted. The relative importance of various risks might also differ in accordance with environmental and market (systemic) factors (see Module 3 of the IOPS Toolkit). For example, longevity risk might be more significant in a developing country with rapidly improving mortality, whilst inflation rates and the liquidity and volatility of investment markets can vary significantly from one country to another—and at different times in a particular country, creating different risk-management priorities for pension funds and plans and their supervisors.

In the same way that risks can vary over time, there can also be changes needed to weightings applied. For example, weightings might be applied in relation to certain external factors such as volatility in investment markets and may also change over time and so it is important that pension supervisory authorities regularly review them to ensure that they remain appropriate.

Weighting, like other aspects of risk-based frameworks, can be susceptible to ‘gaming’ by individual supervisors. A number of supervisory authorities have had experience of supervisors ‘reverse engineering’ their scores so that they obtain the risk ranking which they think is appropriate, and not the one that is given by ‘the system’. Supervisors could do sensitivity tests on their risk weightings, or back testing to try and ensure accurate and consistent approaches to weightings.

B. Probability

Once the different risk categories and mitigants have been suitably weighted to match the structure of the pension fund, the overall riskiness of the fund is often then rated according to the probability of these risks occurring and the impact which the fund would have on the pension system in general should anything go wrong.

Assessment of the probability of an adverse event is theoretically based on the statistical concept of *conditional probability*. If certain characteristics are known historically to correlate with the occurrence of the event, the probability of the event occurring can be expressed as a function of the characteristics observed in any particular fund. While the approach is based conceptually on conditional probability, the models actually used by supervisory authorities to measure the probability of an event are typically much simpler and more subjective than would be expected under a strict conditional probability approach. They also vary widely. In some cases, risks are combined additively, in other cases they are multiplied.

Some jurisdictions measure probability at both the inherent and residual risk level. While there continues to be a focus on supervisory judgements, some jurisdictions highlighted the use of quantitative indicators to help inform the probability assessment.

In comparing risk-based approaches to a strict conditional probability model, it is interesting to note that conditional probability tends to increase non-linearly and at a declining rate as the number of uncorrelated factors increases. For example, if the unconditional probability of a DB fund’s failure is 10% when poor governance is involved, and 15% when market risk is excessive, and assuming that poor governance and excessive market risk are not correlated, then the probability of failure, “conditioned” on the presence of both poor governance and excessive market risk is $1 - [(1-0.1) \times (1-0.15)] = 1 - 0.765 = 23.5\%$ (not 25% and certainly not greater than 25%). The fact that most RBS probability models are either additive or multiplicative suggests that, at least implicitly, supervisors regard risk characteristics as positively correlated.

The De Nederlandsche Bank (DNB) in the Netherlands does not have an explicit definition of probability within its framework. However, the models on risk level will implicitly take the probability into account. For every type of risk, the framework generates an automatic risk score based on data/models which are assessed (and, if needed, changed) by the expert judgement of supervisors. This risk score captures the

probability of an institution failing on that specific risk source, but the probability is thus not explicitly defined or measured. While the framework does not have an explicit definition, there is room within the individual models to apply a specific definition. The models generate automated scores for the level of risk and for risk management.

Example: South Africa - Financial Sector Conduct Authority (FSCA) Risk ratings for Funds



	Probability rating	Impact rating: Fund Asset value 1 if \$803 313 2 if > \$803 313 < \$6,7 Million 3 if > \$6,7 Million < \$13,4 Million 4 if > \$13,4 Million	Rating (P X I)
Rating of administrator who administers the fund	1 if 0 – 40 2 if 41 – 80 3 if 8 – 120 4 if 121+ 4 if own administered		
Number of outstanding financial statements	1 if 0 2 if 1 4 if 2+		
Number of outstanding valuation reports	1 if 0 2 if 1 4 if 2+		
Number of outstanding regulation 2(e) certificates	1 if 0 2 if 1 4 if 2+		
Surplus scheme submission	1 if Yes 4 if No		
Early warning – information obtained from latest available financial statements			
- Audit opinion	1 if Emphasis of matter 2 if Modified opinion 3 if Disclaimer 4 if Qualified		
- Bank overdraft <i>Cash at bank/current assets</i>	1 if >1<30% 2 if >30<50% 3 if >50<75% 4 if >75<100%		
- Arrear contributions <i>Contributions receivable/total contributions</i>	1 if 1 month 2 if 2months 4 if >3months		
- Reserve accounts	1 if Total>0 4 if Total<0		
- Total Investment cost ratio	1 if ≤5% 5 if 5%≥		
- Exceed prudent investment limits (Regulation 28)	1 if >0<5% 2 if >5<15% 3 if >15<20% 4 if >20%		
Amounts to be allocated	>2%		
- Derivative Residual risk (Schedule IAG2)	5 if ≠ 0		
- Total expense ratio	1 if ≤5% 5 if > 5%		
TOTAL NET RISK RATING			

Note: FSCA is finalising its Supervisory framework and this will have an impact on the above-mentioned risk based supervision model going forward

Example: Australia



The Supervision Risk and Intensity (SRI) Model recently introduced by the Australian Prudential Regulation Authority (APRA) in Australia utilises a formula to establish the entity's 'stage' which determines APRA's supervisory response.

The formula takes the average rating unless there is an outlier in an individual category or combination of categories. The poorest rating outcome of the averages or outliers determine the overall staging. The formula converts the A to F ratings into a numeric rating. Scalars are applied to the combinations and individual ratings to ensure the categories and combinations have the appropriate impact on the staging.

C. Impact

Impact assessments consider impact which the fund would have on the pension system in general should anything go wrong. They are important as they can be a key determinant of a fund's relationship with the supervisory authority (i.e. level of monitoring it will receive). They address the question of how high/low does the impact have to be before the supervisory authority will increase/reduce its oversight?

The range of impact measures is much narrower than for probability but has expanded in recent years. While many authorities continue to use the size of the fund or entity to capture the damage that would be inflicted if the adverse event occurred, a number of authorities are expanding the factors considered. They recognise that fund size may not adequately reflect the potential impact an entity may have on supervisory objectives. For example, a smaller fund may be easier to resolve than a large fund due to the amounts and number of members involved, however, the situation might be different if that small fund is also providing critical services to other funds or, indeed other parts of the financial system.

When using size as a determinant of impact, judgement needs to be applied in deciding how 'large' should be interpreted – with measures of numbers of active or retired members often being used as a proxy. The size of assets may also be used but can be misleading (e.g. an underfunded DB fund may have a limited amount of assets, but this very fact should make it a high risk fund, not a lower priority one). The market share of the pension fund is another size metric that is used in some jurisdictions.

Example: Germany



Supervisory authority BaFin in Germany determines the impact a crisis at a Pensionskassen or Pensionsfonds could have on the financial market exclusively from applying cut-off points. The amount of investments serves as the criteria for defining the applicable cut-off points.

- **Level 4 (very high impact): > EUR 15bn.**
- **Level 3 (high impact): > EUR 5bn < EUR 15bn**
- **Level 2 (moderate impact): > EUR 1bn < EUR 5bn**
- **Level 1 (low impact): < EUR 1bn**

In individual cases an exception may be made to these established criteria (e.g. when the investment volume almost reaches the next cut-off point or when an entity occupies a special place in an individual market that is important for the stability of the financial sector as a whole). It is only possible to jump one cut-off point (e.g. from 1 to 2, or from 3 down to 2).

Any such exceptional treatment must be discussed in the risk assessment meeting and minuted. In addition, in such cases, a written report must be added to the file indicating which impact level should have been applied and why an exception was necessary.

As noted above, problems at even small funds can have a big impact (as the failure of the nationally small but regionally important United Kingdom building society Northern Rock showed in 2007), knocking confidence in the system as a whole if they become a big story in the media. Likewise, pension funds of public bodies (say railways or municipalities) can also have more “impact” than private sector employers of the same size, as the public will demand more accountability from such bodies.

In the example below, De Nederlandsche Bank (DNB) in the Netherlands also distinguishes between prudential and integrity impact.

Example: The Netherlands



Due to the various applicable statutory frameworks, the DNB distinguishes between prudential and integrity impact classes. Classification into a prudential impact class depends, for instance, on the scope of the institution's operations, its national systemic relevance and the function of its operations in society. Classification into an integrity impact class depends on the importance of the institution's gatekeeper function³⁰ and the risk of financial loss or damage or reputational damage in the event of integrity failure.

Each year, before the DNB conducts risk analyses, they classify institutions into impact classes. These classes result from the Risk Tolerance in Supervision Statement described in module 3 and depend on the impact that a failure at that institution may have on trust. Impact class 1 (lowest class) means that the impact of a failure on trust is "low" and that the DNB "accepts the likelihood of failure". For impact class 3 (highest) the impact on trust is deemed to be "high" and "the likelihood of failure is accepted to a very small extent". Impact class 1 institutions are subject to "adaptive supervision", impact class 2 to "active supervision" and impact class 3 to "proactive supervision".

Other jurisdictions are expanding the factors they consider determining an entity's impact including:

- Number of contracts with employers;
- Impact of adverse events measured through stress testing;
- Importance of the pension entity/level of influence over industry;
- Complexity;
- Provision of critical products;
- Substitutability;
- Interconnectedness; and
- Resolvability

By looking beyond size, a pension supervisory authority would have a more complex, but more meaningful concept of impact. In practice this is likely to mean a few 'systemically important' pension plans (and often those are in the public sector) would be considered high impact. In the example noted below from Hungary, the size of an entity remains a key consideration but is overlaid with a range of other factors aimed at identifying institutions of systemic significance. It is noted that determining 'systematic importance' is not a simple issue.³¹ Determining impact thresholds is therefore an art rather

³⁰ As gatekeepers, financial institutions have an obligation towards society to prevent involvement in financial crime, https://www.dnb.nl/media/pljl0ftp/lr_130952_ia_atm_engels_v1.pdf.

³¹ See IOPS (2017a), [Macro- and micro-dimensions of supervision of large pension funds \(iopsweb.org\)](#), IOPS Working Paper No. 30 for further details on the impact of large and systemically important funds.

than a science, which is partly determined by how much protection there is elsewhere in the system (e.g. guarantee schemes, sponsor backup, ombudsman etc.).

Example: Hungary



In Hungary, the purpose of the impact classification is to determine the impact of the prudential risks of supervised institutions on supervisory objectives and to categorize them according to systemic risk. The classification is based on the number of members of the institution and the size of its assets but it may also contain other features that express systemic significance of the institution. Institutions are divided into four categories based on their impact on the financial system and the MNB's supervisory purposes.

Strong impact: large and systemically important institutions;

Above medium impact: medium-sized institutions not included in the former category; these institutions are less important at the system level but have a significant market share in the relevant area;

Below medium impact: medium or small institutions not included in the previous categories; these institutions have less significant market share in their area of operation;

Weak impact: any other small institution that does not fall into any of the above categories (these institutions have negligible market share).

The classification determines the method of supervision applied to the supervised institution and the degree of intensity devoted to supervision, which will be further refined in the risk assessment.

The relative role played by probability and impact differs across regulatory authorities. A bias towards impact means that attention is focused more on activities or events which have a relatively high impact but low probability, whilst a bias towards probability means the focus is more on high probability but relatively low impact events. The choice may be a political one, and the difference can be significant. Focusing on the nature of harm can move impact measures away from an aggregate measure to a focus on individual impacts (i.e. focusing more on the nature of the impact on individuals rather than the number of individuals affected – for example concentrating on particularly vulnerable individuals).³²

As highlighted earlier in respect to the DNB in the Netherlands, the impact assessment determines the nature of supervision ranging from adaptive to proactive supervision. In Australia, APRA uses the impact classification (referred to as tiers) to determine the depth of risk assessment that is undertaken. It is also used to drive the expected level of supervision intensity.

Interestingly, impact plays no role in the Office of the Superintendent of Financial Institutions (OSFI) model used by the federal regulator in Canada. The aggregate risk score for a pension plan is a result of the supervisors' judgement, with no detailed guidelines or formulas. Final risk scores are obtained by offsetting the aggregate risk score against the capital available to the plan. OSFI argue that impact should not be included in such a decision as to give substantially different supervisory outcomes to firms on this basis would discriminate against the consumers of those firms and contrary to their legal mandate (i.e. that all consumers should expect equal regulatory attention).

³² See Black (2008, page 20).

SECTION 3: SUPERVISORY ACTIVITIES TO SUPPORT RISK ASSESSMENTS

The RBS Learnings project³³ gathered insights on the activities undertaken to support risk assessments. Table 4 contains an overview of the activities reported to be undertaken to support entity risk assessments.

Activities by pension supervisory authorities to support an entity risk assessment varied across jurisdictions. In some jurisdictions there was also variation in the depth of analysis and scope of the activity for different entities. A key determinant for the variation in supervisory effort to support the risk assessment appears to be the impact the entity may have on the supervisor achieving its objectives (see section 2 for more details on impact assessments). Some examples of the varied approaches include:

- The Netherlands where all entities within an impact category are subjected to the same basic supervisory programme. The scope of the basic program differs between impact classes and is smaller for lower impact entities. The basic programme's purpose is to identify risks and concerns and where it exposes risks outside of risk tolerance, additional activities are undertaken in accordance with a risk-based program
- Australia where an entity's potential impact not only guides the level of routine supervisory attention used to identify and monitor risks and issues, but also adjusts the depth of risk assessments undertaken with more in-depth risk assessments undertaken for more impactful entities. The outcomes of the risk assessments then guide the supervisory response to ensure that entities with identified material prudential risk are appropriately escalated and subjected to more intensive supervision aimed at resolving the underlying issue or concern.
- Guernsey where the level of engagement with the entity, including reviews, assessments and meetings, will correspond to their impact category with medium or low impact entities subject to a less intense set of engagement tasks than high impact entities.

It is worth noting that all three jurisdictions listed above included clear statements about the adjustment in supervisory effort and their consideration of the potential implications within their communications to stakeholders. For example, the Netherlands states that for its lowest impact class it recognises its approach may allow risks to go unnoticed, Australia explains that the approach ensures that entities receive a sufficient level of attention in line with the authority's risk appetite and Guernsey acknowledges that it is making a conscious decision to focus on its most important entities on the basis that they are the entities they do not wish to see fail in a disorderly manner.

³³ IOPS (2022a), [Report on learnings from the design, implementation, use and review of risk based supervision by pension supervisory authorities](#), IOPS Working Paper No 38.

Public version

Table 4 Supervisory activities to support risk assessments³⁴

Activity	Key observations
Data collection and analysis	<ul style="list-style-type: none">• Supports quantitative assessments and can provide initial evaluation from which other supervisory activities can build upon (e.g. Netherlands collects data that uses quantitative metrics to form an initial assessment from which other supervisory activities, including further data collection and analysis, can build.).• During the Covid-19 pandemic, greater reliance was placed upon data collection and subsequent analysis undertaken.
Meetings and engagement	<ul style="list-style-type: none">• Mostly involved meetings with representatives of supervised entities but some supervisory authorities have reported meeting with other key persons such as the auditor or the actuary.• Used to support risk identification and risk response. The frequency and focus may be adjusted depending on the potential impact of a pension fund or its risk profile.• Noted to be also an opportunity to share key messages with entities, to clarify expectations of them and for pension funds to know who to approach if issues arise.• During Covid-19, these meetings needed to be held virtually. It is not apparent as to whether this impeded supervision or if, in fact, there were any positive benefits from this altered approach.
In depth reviews	<ul style="list-style-type: none">• The main objectives of in-depth evaluations include: to supplement on-going supervisory efforts, to detect problems that may not otherwise be evident, confirm or investigate findings from regular monitoring programs and assess the effectiveness of prior supervisory responses.• Usually conducted onsite, but undertaken offsite during Covid-19, these reviews involve an in-depth review and testing of an entity's practices and operations.

³⁴ From IOPS (2022a), [Report on learnings from the design, implementation, use and review of risk based supervision by pension supervisory authorities](#), IOPS Working Paper No 38.

	<ul style="list-style-type: none"> • They can be undertaken as part of routine supervision aimed at identifying risk but are also carried out when there are risks identified that require further exploration or where the underlying cause of an issue needs to be better understood and addressed. • There can be varying approaches taken to in depth reviews. In some instances, lengthy reviews are undertaken looking across all of the operations. In other instances, the reviews are more targeted, focussing on a particular risk or part of the operations. • For some supervisory authorities that adjust the level of supervision based on an entity's impact assessment, in depth reviews were noted to be undertaken more frequently for the more impactful entities and may not be undertaken at all for some of the lower impact entities. • Lithuania noted that it has been increasingly making use of shorter on-site visits with specific and narrow subjects aimed at gathering information and assessing the entity's operations
Stress/scenario testing	<ul style="list-style-type: none"> • Reported by some supervisory authorities to help form a view on a pension fund's impact as well as its risk profile and, thereby, can identify entities for greater focus and supervisory attention. • May be undertaken on a proportionate basis. (i.e. some small pension fund with low risk assets might be excluded as is the case for BaFin in Germany)³⁵ • Can provide insights across entities and give a perspective about a peer group or industry in certain scenarios.
Self-assessments	<ul style="list-style-type: none"> • Most recently observed as an activity undertaken by a number of jurisdictions to evaluate and assess the management of information security and cyber risk issues.³⁶ • Can provide insights across entities and give a perspective about a peer group or industry in certain scenarios.
Information collected from peer regulators	<ul style="list-style-type: none"> • Information from peer regulators can be used to inform the risk assessment of entities, peer groups and industry.

³⁵ See presentation from 2022 RBS Workshop for further details <https://community.oecd.org/docs/DOC-219531>

³⁶ See IOPS (2021a), [Supervisory approaches to enhancing cyber resilience in the private pension sector: High-level summary of Members responses to the questionnaire](#), Working Paper No. 37.

	<ul style="list-style-type: none"> • Can support early identification or escalation of issues and may also support consistency in response across regulators for common issues.
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Source: IOPS Secretariat

SECTION 4: CONSISTENCY OF SCORES

Once the supervisory authority has built its model, decided upon and weighted its inputs, a risk score can be derived for supervised entities. These risk scores then need to be checked for accuracy and consistency – which is usually done by a central risk unit within the authority.

Central vs Individual Judgement

One of the key decisions when building a risk-scoring model is determining how much influence the individual supervisor should have in devising the risk-scoring, vs how much central control there should be. De Nederlandsche Bank (DNB)'s ATM model approach is described further below. It retain the ability for supervisory judgement to override automatically generated scores in a transparent manner.

Example The Netherlands
 <p>DNB's supervisory methodology uses a fixed set of 17 risk categories for different types of institutions. This set of categories includes both prudential risks and risks related to AML/CTF for which the same supervisory evaluation program applies.</p> <p>Institutions are assigned an impact class, roughly based on size, to determine the frequency with which supervisors are required to evaluate the automatic scoring for each of the 17 risk categories. The automatic scoring is based on models developed by in-house experts and can be based on a combination of key risk indicators or a score extracted from self-assessments.</p> <p>The automatic scores are directly available to supervisors in their assessment tool after regulatory reporting is received and processed by a central team.</p> <p>In the assessment tool, individual supervisors then have to decide whether to override the automatic scores and must record an explanation for any overrides.</p>

According to supervisory authorities who were the 'early adopters' of risk-based systems, such methods for centrally 'pre-populating' scores developed over time, and so now tend to be characteristic of a second or third generation risk model. Those introducing them now have benefited from this experience by introducing the technique straightaway. Pre-population can be an extremely useful way in which the centre can structure the judgement of supervisors. Indeed, some financial supervisory authorities have found that the only way to ensure that supervisors capture the external or systemic risks which it sees as relevant to a firm, for example, is to pre-populate the risk scores.

Some supervisory authorities find that the obstacles to getting information on all the different risks from a wide number of supervisors or teams, each of which is looking at a particular part, is simply so challenging that it is rarely done. For those that do try to establish a system-wide view as part of their standard operations, it is easy for internal structures to proliferate. This clearly affects the speed and responsiveness of the supervisory authority, something which is particularly relevant where external market conditions are highly relevant for risk assessment and where these are changing rapidly. It is hard to have a 'real time' risk analysis if everyone in the organisation has to have a view. Yet if only a central risk unit does the evaluation the

danger is that this would not be seen as valid, as it had not been validated by all the different units within the authority. There is thus a trade-off between ensuring accuracy, consistency, and ‘buy in’ from across the authority with speed and responsiveness.³⁷

Much depends on the internal culture within the organisation. In some authorities the supervisor can be seen as ‘king’ within the organisation, and as knowing the firm better than anyone else. This can make it very hard for a central risk unit to get the organisation to move to a ‘portfolio’ approach (comparing risks across the supervised universe) rather than one led by individual risk assessments, or indeed to get supervisors to change their assessments. It can make for internal difficulties, as it is hard for supervisors to accept that ‘their’ firms are not as significant for the regulatory organisation, and thus of deserving as resources, as someone else’s. On the other hand, where personal judgement is removed from the system supervisors may feel ‘devalued’.³⁸

³⁷ See Black (2008, page 31).

³⁸ See Black (2008, page 31).

Example: Guernsey³⁹



The Guernsey Financial Services Commission (GFSC) assesses a firm's risk probability in a number of categories and subcategories such as credit risk, operational risk, governance risk, etc. Supervisors of higher impact firms are required to make a conscious choice about the riskiness of a firm at each level in each category. Simplified procedures apply for supervisors of medium low impact firms. All firms, including those that are low impact, are probability assessed for the financial crime risk each poses by a dedicated team of AML/CFT supervisors within the Commission.

Supervisors are required to provide a written rationale for their judgements within the PRISM system. This allows their logic to be easily reviewed by others in the Commission before actions are taken based on their judgements.

Supervisors are also required to consider all probability categories to arrive at a balanced judgement about the overall risk probability posed by a firm. The GFSC places particular emphasis on a thorough analysis of governance and business models as they consider poor governance and a weak business model are good leading indicators that problems at a firm are likely to emerge.

In making judgements on probability, supervisors at GFSC are assisted by:-

- the information and insights they have acquired through engagement tasks. Some engagement tasks will have a significant quantitative element, while others will be more qualitative;
- key risk indicators – key ratios and data drawn from the regulatory returns submitted to the Commission and processed by the Probability and Risk Impact System (PRISM) (which will highlight unusual changes);
- risk guidance materials on each risk category, prepared and kept up to date by subject matter experts within the GFSC. These materials also provide links to in depth guidance published by other regulatory bodies to assist a supervisor undertaking a thorough analysis of a risk category;
- alerts generated by PRISM to draw a supervisor's attention to significant changes in key risk indicators or impact data; and
- peer group intelligence – firms supervised by the GFSC are placed in peer groups. Supervisors can access pertinent quantitative and qualitative information about other firms in their peer group which allows for easy comparison of key quantitative risk indicators

Checking Mechanisms

The level of individual judgement in risk scoring has a consequent impact on the amount and type of central checking of a score which is then done by the supervisory authority to ensure consistency. Internal governance structures are a key issue in ensuring consistency of assessments across a large number of supervisors, and it is not always easy to get this right. In addition to training, key issues include ensuring that internal comparisons and validations are made of supervisors' assessments. Getting an 'all round view' of risks without creating overly cumbersome committee/panel structures and paralysing the organisation in procedures is a key issue.

³⁹ See RBS Toolkit [Case study for Guernsey](#).

Example: Australia



The quality and consistency framework for the SRI Model comprises three levels:

- support foundations to aid supervisors in determining risk assessments and supervision action plans. These foundations include five key components – assessment criteria, supervisor training, quantitative decision support, validations process and sign-off protocols;
- portfolio reports and watch list reports designed to monitor higher risk and higher impact entities, and risk profile shifts from a portfolio perspective; and
- hindsight review and assessment to evaluate the effectiveness and outcomes of current supervision practice and make changes where necessary. This level consists of peer group benchmarking sessions and peer reviews.

Within most supervisory authorities there is a separate set of officials responsible for the design and ongoing maintenance of the risk-based system. This unit evaluates the framework, and sets the risk parameters on which the gradings are based. The relationship of this unit with the rest of the regulatory organisation varies. It may be focused specifically on risk analysis, or have a wider role. APRA, for example, established a team, which is a single team across APRA dealing with all the different industries, and which is responsible not only for the maintenance and development of the risk framework, but monitoring supervisory activity across the whole of APRA, training supervisors and producing guidance for them.

Example: The Netherlands



The Dutch Central Bank's (De Nederlandsche Bank (DNB)) supervisory methodology was developed by a project team comprising representatives from all supervisory divisions, as well as IT. As the project developed, input from the team was obtained via information meetings and substantive discussions on specific issues with experts from within the supervisory divisions.

After the project, a governance structure was put in place to update the methodology (e.g. embedding sustainability related risks in the supervisory evaluation program) and to monitor implementation and application of the methodology at all supervisory divisions.

The governance consists of a senior management steering committee with monthly meetings and a team with participants from all supervisory divisions.

For risk-scoring models to work, supervisors' own behaviour in performing the risk analysis also needs to be understood. Risk assessments are inherently judgemental, but are critical to the supervisory authority's understanding of the entities it oversees and to its response. The supervisory authority therefore needs to understand how individual supervisors behave when making those judgements. Authorities which are into their second or third generation of risk-based frameworks are developing an awareness of how they need to structure the assessments to adjust for supervisors' behaviour. For example, through its validation processes

one authority discovered that supervisors would over-estimate the quality of management and controls to a relatively high degree, around 30%, and moreover that this over-estimation was consistent across supervisors. Helped by the consistency of the judgements, the authority is able to adjust the basis of the calculations of the risk scores to take this over-estimation into account.⁴⁰

Some authorities allow senior management in different areas to customise the model and adjust the weightings and aggregations of risk scores in their industry areas. Supervisory authorities have found that this has helped to engage managers; as one member of a risk team commented, ‘they can play with it’. However, it had the effect that the risk scores went up, as everyone thinks their area is more risky than anyone else’s. Central risk units then find themselves having to ‘rebase’ the scores to scale them down, and readjust them between divisions in line with its own evaluations to ensure that resource allocation was not distorted.

One of the problems that authorities with some years’ experience of risk-based frameworks have found is that the system can return false positives or negatives, depending on how it is designed. Where a supervisor is not sure of how to grade a particular risk, in some systems they can leave this blank. If the IT system underlying the framework automatically defaults to a low-risk score, the result can be a lot of false positives. It may be that the score was left blank because it was low risk, but it may also have been left blank because the supervisor did not look at the issue or did not understand it. Authorities have met this problem in different ways. Some ensure that frameworks cannot be left blank, so one of the appointed solutions is to fill a medium score to those criteria for which there is no available information, to avoid giving weight on high or low priority which could lead to false judgements. One solution – not yet applied by any IOPS members – could be to require supervisors to state their confidence level in their assessment - although there are issues as to whether inspectors or supervisors will in fact admit to lack of confidence.⁴¹

Ensuring that assessments of firms are forward-looking is also a challenge. Risk assessments often only capture the risks apparent today. Some supervisory authorities include a ‘direction of travel’ indicator in their risk assessment: is the firm likely to improve or deteriorate over the period to the next inspection. Such judgements are built into the Hungarian authority’s (Central Bank of Hungary) risk assessment model, the risk matrix used by the Office of the Superintendent of Financial Institutions (OSFI) in Canada. However, many others do not explicitly require this assessment, and have found that supervisors tend to focus on the risks as they appear now, and not on what might happen in the near future.

Supervisory authorities should retroactively test their models to validate the risk scores given and to check that these do correspond with reality and did pick up major problems. Risk-based systems also entail their own risks and they need to have mechanisms for monitoring and assessing the potential risks that the frameworks themselves can create and for adjusting the framework and process accordingly. For example, the risk of myopia – where RBS becomes simply another set of boxes to be ticked, so that supervisors end up being blind to seeing risks which were not anticipated by the designers of the framework – or to something which is a problem but falls outside it. Alternatively, RBS frameworks can create incentives for firms which results in them acting in a way which actually creates more risk. For example, by signalling that low impact firms will automatically receive low oversight there is little incentive for them to comply – yet non-compliance of many small firms can add up.⁴²

⁴⁰ Black (2008, page 23).

⁴¹ Black (2008, page 36).

⁴² See Baldwin and Black (2007), which stress how ‘really responsive regulation’ needs to assess its own performance.

In a survey of pension supervisors approximately 60% of respondents were undertaking regular reviews and/or assessments of their RBS approach⁴³ including the risk model. BaFin in Germany carries out validation of their model. This implies conducting quality control on the data input, data output and the whole process. BaFin distinguishes between a “small validation” (plausibility check) and a “big validation” (statistical-mathematical validation). Both kinds of validation are conducted on a regular basis, whereas under specific circumstances an extraordinary validation can be executed. Depending upon the result of the validation, it might be necessary to change the risk classification process and to customise it to the result of the validation. Triggers for validations could be external (e.g. changes in legislation) or internal factors (such as the introduction of a completely new rating system). The results of the validation are documented.

⁴³ IOPS (2022a), [Report on learnings from the design, implementation, use and review of risk based supervision by pension supervisory authorities](#), IOPS Working Paper No 38. Further details regarding the review and maintenance of RBS are addressed in Module 1.

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