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Synthesis Paper: The role of actuarial calculations and reviews in pension supervision

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SYNTHESIS PAPER: THE ROLE OF ACTUARIAL CALCULATIONS AND REVIEWS IN PENSION SUPERVISION

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ABSTRACT

Actuarial calculations and reviews provide information that is often viewed as very crucial for risk management and governance of pension funds. As such, among other things, pension fund managers and/or trustees customarily use actuarial calculations and reviews in making funding and investment decisions and in assessing risk exposures. Therefore, calculations and reviews play a significant role in the operation and, ordinarily, in the supervision of pension funds.

This synthesis paper is an abridged version of the background paper published as IOPS Working Paper No. 24. It briefly describes calculations and reviews, the role of the actuary as well as other different professionals undertaking these calculations. It then discusses the role that calculations and reviews can play in pension supervision, and concludes by outlining the challenges (and potential solutions) for supervisors using actuarial calculations.

The main finding of the paper is that actuarial calculations and reviews have a crucial role in the oversight function, especially when considering the supervision of DB and hybrid pension funds. Their primary function, in the pension supervision process of such funds, is to ensure that the entities are complying with the legal provisions on how the fund is operating as well as complying with the requirements for funding.

The paper identifies several potential challenges that might be faced by supervisors with regard to the conduct or role of actuarial professionals. These relate to: quality of actuarial assumptions, use of technical language, inaccurate information or responsiveness of professionals involved in actuarial calculations and reviews, their independence, adequacy of resources, availability of timely information and observance of statutory requirements or legal changes.

Keywords: actuaries, supervision, private pensions, actuarial calculations

JEL codes: G-22, G-23, G-28

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SYNTHESIS PAPER: THE ROLE OF ACTUARIAL CALCULATIONS AND REVIEWS IN PENSION SUPERVISION

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I. Introduction

1. Actuarial calculations and reviews (calculations and reviews”, cf. definitions paragraph 6 below) provide information that is often viewed as crucial for risk management and the governance of pension funds. As such, among other things, pension fund managers and/or trustees customarily use calculations and reviews when making funding and investment decisions and when assessing risk exposures. Therefore, calculations and reviews play a significant role in the operation and, ordinarily, in the supervision of pension funds. This is especially so for defined benefit (DB) pension for which actuaries assess fund solvency and recommend individual as well as sponsor contributions, thus enabling the fund to both honour liabilities during the decumulation process and for the fund to have long-term financial sustainability.

2. However, there has been a global decline in the number of DB pension arrangements, which theoretically decreases the number of calculations and reviews required for the governance, risk management and supervision of pension funds. This is of relevance to pension supervisory authorities and to actuarial professionals since it has implications for how supervision is undertaken and how and for what functions actuarial professionals may be engaged by pension funds and/or supervisory authorities.

3. In a collaborative effort, the International Organisation of Pension Supervisors (IOPS) and the International Actuarial Association (IAA) each surveyed its members to investigate the prevailing functions of actuarial professionals as well as the role of calculations and reviews in the supervision of pension funds as perceived by pension supervisors and actuaries. With the declines in DB arrangements the research sought to ascertain if there are any emerging areas and to extract the implications this may have on pension supervision and the role that actuaries play.

4. On the basis of the foregoing, the scope of the survey not only encompassed the use of calculations and reviews in DB funds, but also spanned their use in defined contribution (DC”) and hybrid funds. This paper takes into account the IOPS *Principles of Private Pension Supervision* (2006) (IOPS Principles) and the *OECD Recommendation on Core Principles of Occupational Pension Regulation* (2009) (OECD Recommendation). The IOPS Principles and OECD Recommendation serve as important supervisory and regulatory tools and provide an explicit link between pension supervisors, regulators and actuaries.

5. This paper briefly summarises the main findings from the research.¹ For more detailed findings and analysis, please refer to the Background paper published as IOPS Working Paper No. 24, which provides the comprehensive findings from the perspectives of actuarial professionals and the supervisors.

Definitions

6. *Actuarial calculations and reviews* refer to calculations using actuarial mathematics, or actuarial methodologies, as opposed to calculations solely undertaken by (qualified) actuaries. We employ this definition because not all jurisdictions engage the services of (qualified) actuaries in pension governance and supervision.

7. *Actuarial mathematics, or actuarial methodology*, denotes the application of mathematical and statistical methods to assess risks, in this case in pensions.

8. *Pension fund* is understood as “the pool of assets forming an independent legal entity that are 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” (OECD, 2005).²

9. *Pension plan* (or equivalently *pension scheme*) is defined as a legal binding contract with explicit retirement objective (OECD, 2005).

Methodology

10. To clarify the role of calculations and reviews, the IOPS and the IAA conducted a survey in 2014 among both organisations’ members. All members of the IOPS (83 authorities as at the date of the survey – 41 responded) and all members of the IAA Pensions and Employee Benefits Committee (39 institutions at the date of the survey – 28 responded) were invited to participate in the survey.

11. Although the questionnaires were distributed to each group of participants, they differed slightly from each other in that they primarily targeted the same information from different angles. The topics covered in the questionnaires included:

- (a) interaction between the supervisor and the professionals undertaking the calculations and reviews;
- (b) recognition of the importance of calculations and reviews in pension schemes;
- (c) recognition of the importance of calculations and reviews in risk management;
- (d) the role of calculations and reviews in informing the different stakeholders;
- (e) whether a qualified actuary is required to conduct the calculations and reviews and/or what specialists other than qualified actuaries are performing the calculations and reviews; and
- (f) responsibility issues.

¹ The paper benefited from numerous valuable input and comments by the IOPS Members. In particular, we would like to thank André Tapernoux for his extensive contributions especially to the section on potential supervisory challenges.

² OECD (2005: 46).

II. Actuarial calculations and reviews and the role of the actuary

12. Calculations and reviews play different roles in different pension funds.³ Generally, funds are characterised as defined benefit (DB) or defined contribution (DC), with certain funds belonging to a third category called hybrid. Usually, calculations and reviews are most needed in DB funds, whereas in DC funds their role is limited.⁴ In hybrid funds, the importance of the calculations and reviews depends on the extent to which DB elements are present in the fund. This is accentuated by the *OECD Recommendation on Core Principles of Occupational Pension Regulation* (2009), which requires that DB and hybrid occupational pension plans have a funding policy that specifies amongst others, what actuarial method has been used (cf. Implementing Guideline 2.6). The following paragraphs in this section relate largely to DB/hybrid funds.

13. Traditional actuarial models have been deterministic, which means they have been fairly simple. A benefit of these deterministic models is that they are often intuitive to the intended audience. On the other hand, they do not contain all the information that might be necessary for a pension fund. Currently, stochastic actuarial models are more relevant; although often less intuitive than the older deterministic models, they help in analysing a pension fund and give the user the possibility of assessing risks in more detail.

14. One of the principal financial risks to which pension funds are exposed is the longevity risk. A similar risk also arises from earlier than anticipated retirement due to disability. However, these risks are more pooled among members in a DB pension fund than in a hybrid,⁵ and even less so in a DC pension fund. And, while a pension fund often contains risk sharing between members of the fund and the sponsor or employer, the financial health of the fund usually depends on the reliability of the employer in financing the fund.

15. To assess a fund's short- and long-term financial status, actuarial techniques are used to create a mathematical and statistical model of the fund. This is primarily for the case of DB schemes. The model uses the demographics of the fund members along with either general or industry-specific experiences to assess biometric risks. Customarily, this will result in the risk-weighted cash flows of the fund, which, when discounted, will yield the value of the pension fund's liabilities. A comparison is then made with the assets of the fund, which allows an assessment of how well the assets are matched with the liabilities. In addition, the model can usually be used to assess the future of the fund; that is, to determine whether the financial burden of the fund can be borne taking into account the future of the employer and the workforce.

³ The IAA (2002) paper identifies the following areas:

- (i) Pricing and product design;
- (ii) Monitoring the expectations of policyholders and potential policyholders where policies allow the management of insurance companies to exercise discretion over contractual terms and conditions;
- (iii) Establishing aggregate policy and claim liabilities;
- (iv) Determining compliance with legal or regulatory capital requirements when applicable and recommending appropriate capital levels; and
- (v) Reporting responsibility directly to the Board and, if statutorily required, to Regulators.

⁴ The role of actuarial calculations in DC systems, from as a purely prudential role, may be limited. However, the role could be much wider in some jurisdictions where there is more emphasis on and supervision of target retirement issues, and this is encouraged (cf. IOPS, 2005). See also paragraph 24.

⁵ By 'hybrid' we mean here a pension plan that has features of both DB and DC pension plans.

16. Calculations and reviews do not only help in determining the overall financing of a pension fund. There can be situations in any fund, at least in principle, where the overall financial circumstances are reasonably stable, but members of the fund receive extraordinarily inequitable treatment. For example, let us assume that there is a fund where employees have different terms based on their age or the time they commenced employment. Let us also assume that such a fund would give, in the 1980s, a guarantee of at least a 5% increase in benefits and would maintain this for the employees who joined the fund at that time. However, employees hired currently would have a guarantee of 0%. The investment income would first be used to cover these guarantees with anything left given as discretionary benefits. This would mean, however, that under the current financial circumstances all investment gains would be used to finance the earlier 5% guarantee and practically nothing would be given as discretionary benefits. This situation would, therefore, be fairly inequitable for the new fund members. In these cases, calculations and reviews reveal whether problems such as these are occurring so that the governing body, trustees or other decision-makers can take corrective actions, and make appropriate decisions to rectify the issues being experienced by the fund.

17. Professionals undertaking actuarial calculations fulfil many roles over a broad range of environments, including government, health organisations, insurance companies, pension plans/funds, regulatory regimes, risk management and several other fields. They have a detailed understanding of economic, financial, demographic and insurance risks and possess expertise in:

- (a) developing and using statistical and financial models to inform financial decisions;
- (b) pricing, establishing the amount of liabilities and setting capital requirements for uncertain future events.

18. These professionals also provide advice on the adequacy of risk assessment, reinsurance arrangements, investment policies, capital levels and stress testing of the future financial condition of a financial institution. Oftentimes, these persons are qualified as actuaries and belong to professional associations. The role of a professional actuarial association varies from country to country. However, most associations:

- (a) have a credential that people in the actuarial field may gain, confirming that they have met high educational standards and are bound to high standards of professional conduct and practice;
- (b) enforce professional requirements on qualified actuaries;
- (c) further the science and art of actuarial practice;
- (d) serve as the voice of the profession in the public interest when interacting with governments, the public and other organisations;
- (e) promote the profession to the public and users of actuarial services, both current and potential;
and
- (f) provide continuing professional development for their members.

19. Mathematical and statistical methods, as well as the use of actuarial techniques, are not only within the expertise of actuaries. Other professionals with suitable education can perform actuarial calculations. These professionals include engineers, mathematicians, physicists, statisticians or others from similar backgrounds. With respect to pensions, and in line with practice, the OECD Recommendation prescribes that “[a]ll actuarial valuations [of liabilities] should be carried out by an actuary, or by another

equivalent specialist, who has had appropriate training and experience in the field of pensions” (Implementing Guideline 3.11 in OECD, 2009).

III. The use of actuarial calculations and reviews in pension supervision

20. IOPS aims are “to improve the quality and effectiveness of the supervision of private pension systems throughout the world, thereby enhancing their development and operational efficiency, and allowing for the provision of a secure source of retirement income in as many countries as possible”.⁶

21. According to IOPS *Guidelines for the Supervisory Assessment of Pension Funds*, 2008, “[t]he objective of regular collection and analysis of pension-fund specific information is to enable pension supervisory authorities to monitor and assess the risk profile of pension funds and to plan its supervisory approach”.⁷ This is encapsulated in the 11 guidelines set out in the document, the first two of which deserve repeating in the current context:

Guideline 1: Information Gathering and Sharing

The *pension* supervisory authority should receive the necessary information to conduct effective assessment and to evaluate the risks in individual pension funds as well as the market as a whole (...) [emphasis own]

Guideline 2: Reporting Requirements

Basic reporting requirements should apply to all pension funds. Though specific requirements will be determined by supervisory needs and the structure of the pension system, basic fund information, financial information, governance information (including market conduct, transparency and disclosure policies) and investment information should be considered. Information should be collected with adequate frequency, detail and amount, but should not overburden the pension funds themselves, and reporting requirements should be reviewed periodically.

22. From these Guidelines, it seems that in large part, calculations and reviews either directly or indirectly provide the information that supervisors should require from their supervised entities. Calculations and reviews form the basis of valuations and funding of a plan and address asset liability matching (ALM) and, where applicable, solvency. This type of information allows for proactive supervisory action, as it helps supervisors achieve their objective of securing retirement income for the members of the fund through an assessment of the risks, financial health and the probability that a pension fund will sustain into the future on the basis of the information generated by the calculations and reviews.

23. IOPS also looks at the risk management aspects of pension funds. Good Practice 3 of the OECD/IOPS *Good Practices for Pension Funds’ Risk Management Systems*, 2011 addresses funding and solvency risk control, and Good Practice 4 addresses investment/market risk control. Risk management generally analyses what the main potential threats are to a pension fund/entity/plan as well as any issues that should be taken into account if any of the features of the plan are to be changed. It seems clear that calculations and reviews are essential to a properly functioning risk management system.

⁶ <http://www.iopsweb.org/about/>.

⁷ Preamble, page 4 in IOPS Guidelines.

24. The role of actuaries in risk management⁸ is an area gaining more importance. While it has gained more prominence in DB funds, it is not unimportant in DC funds. In DB funds, actuarial calculations and reviews usually address the issues outlined in paragraph 22 above. However, in a pure DC fund, the investment risk is borne by the members, and biometric risks are not pooled (the employer's role is only to pay the contribution agreed and everything else is up to the member). Nevertheless, actuarial involvement can be important if there is a requirement, or at least an option, to annuitise savings in a DC fund when retiring. In addition, if changes such as a target retirement income were introduced, whereby the investment process aims to deliver a defined income level plus some level of return in probabilistic terms, then supervisors would definitely require more actuarial work to be able to supervise this type of framework. In this case, actuarial professions may help in predicting the contribution level required to achieve the targeted level of income, which minimises elements of individual risk. Also, the role of actuaries in risk management of DC funds can encompass such important functions as calculating expected benefits and helping stakeholders understand the uncertainty of these projections.

25. The OECD Recommendation explicitly gives actuarial valuations an important role in the supervisory process. Its Core Principle 7 on Supervision stipulates that the “[e]ffective supervision of pension funds and plans must be set up and focus on legal compliance, financial control, actuarial examination and supervision of managers”. Implementing Guideline 7.14 specifies that supervisors may, in cases of insufficient capacity, or any other reasons that are deemed necessary, outsource their supervisory tasks to third parties, including actuaries. Notwithstanding, the supervisory authority remains responsible for the supervisory process and its decisions.

26. In addition to the supervisory authorities, calculations and reviews are used by other stakeholders. Members of pension schemes (participants and beneficiaries) need information on their benefits. Often, actuarial calculations and reviews are directly or indirectly an important part of this information. Trustees (where applicable) manage the fund and certainly need actuarial information. Sponsors also need to be aware of the financial burden they carry for their pension fund. Calculations and reviews are an important element to assess this burden. Sponsors often need calculations and reviews for their accounting (e.g. IAS 19). They also often need actuarial calculations in connection with taxation.

IV. Main findings

27. **The research found that calculations and reviews have broad use in pension supervision.** However, there are varying requirements for the professionals undertaking calculations and reviews in the different jurisdictions. In some jurisdictions, a qualified actuary is required to perform the calculations, whereas in other jurisdictions, there are no formal requirements. In general, requirements that are more formal are imposed on professionals undertaking calculations for DB pension funds, and **they are more important in DB and hybrid pension funds than in DC funds.**

28. Some jurisdictions operating pure DC plans/funds either have a very limited or no particular role for calculations and reviews. Moreover, in some of these same jurisdictions, the pension industry is in a nascent stage, which further reduces the role of calculations and reviews. In connection to DC funds, in many cases supervised funds are not mandated to appoint actuarial professionals. Because of this, the main findings that we discuss below are, to a greater and more significant extent, related to DB and hybrid funds.

⁸ See, for example, an exposure draft by the Actuarial Standards Board (2014).

IV.1. Legislative and prudential requirements placed on actuarial professionals

29. The research evidence shows that globally actuarial professionals are more often than not required by law to meet certain minimum criteria regarding academic qualifications and professional experience. In a number of countries, there is the need for these professionals to fulfil the credentials of a qualified actuary. Additionally, in several cases, the actuarial professional is required to be a member of a professional association and to abide by the relevant code of conduct and standards of these bodies as well as to be approved by the supervisor before being appointed by a pension fund. In some instances where there is no requirement for approval in place, the supervisory authority is empowered to require an appointed professional's removal from office, if the supervisory authority is of the opinion that the person was not fit to hold the position. In some jurisdictions, there are also regulations prohibiting the actuarial professional from assuming certain positions to avoid conflict of interest. While there are sometimes fit and proper requirements (discussed more in section IV.4 below) inscribed in law, this is not a general rule.

30. Another set of standards stipulated in law related to actuarial assumptions are the discount rate and mortality tables to be used by the actuarial professional when performing the calculations and reviews on behalf of a pension fund. In contrast, there are a few jurisdictions where the actuarial professional has full latitude to perform the actuarial calculations and reviews in the manner they see fit, as there are no explicit restrictions on their work stipulated by legislation. In only a few jurisdictions, there are no formal requirements.

31. Given the nature of the work that actuarial professionals perform and the level of reliance that supervisors and the governing body of a pension fund places on the results of the actuarial professional's work, having legislative and prudential standards in place to guide the work the actuarial professional performs is practical. Legislative and prudential requirements reduce the level of risks that would arise from negligence or lack of professionalism that could occur in the absence of these requirements. In other words, these requirements reduce the potential risk exposure to a pension fund. Having formal requirements in place reflects and provides an assurance that actuarial professionals are performing at least at a minimum level.

IV.2. What problems do supervisors want answered by actuarial calculations and reviews?

32. The research found that supervisors generally expect that the calculations and reviews will put them in an informed position about **the longevity risk** that a pension fund is exposed to, as well as give an indication of the funding requirements and the contingencies in place to secure the interests of fund members and beneficiaries as well as to ensure the long-term financial viability of a pension fund. As such, supervisory authorities need to understand **the long-term viability of a fund and to be assured of the ways in which the interests of the members to the fund are protected**. In the same vein, actuarial professionals are expected by some supervisors to present long-term recovery plans for funds that are in deficit.

33. Supervisory authorities also had an interest in having knowledge about the **required investments that would sustain the fund and to perform an evaluation of the economic conditions of a pension fund**. We also found elements existing in this area which demonstrated a reflection of the legislative provisions in the countries surveyed. Only a limited number of jurisdictions did not place any weight on the information contained in the calculations and reviews.

34. The answers that supervisors require from the calculations and reviews are a corollary of their gatekeeping function. On the basis of the answers the calculations and reviews provide, the supervisor is able to make an assessment of how financially sound a pension fund is and to make a determination on whether or not the interests of pension fund members (participants and beneficiaries) are protected. It

therefore follows that the supervisor will either secure assurance regarding the actuarial professional's results or, where necessary, will require corrective action from the pension fund to rectify an existing issue or to take action to bring the fund into compliance with any provisions of the relevant legislations in place.

IV.3. Responsibilities and liabilities of the actuarial professional

35. The survey tested three areas of the actuarial professional's responsibility: towards the plan, the auditing process and the supervisor.

36. **In a majority of the jurisdictions, it is the pension fund⁹ that appoints the actuarial professionals.** As such, the actuarial professionals' responsibilities – which are often in line with what is required by law or what is determined contractually, and which generally involve the financial performance of the pension fund – are heavily skewed towards the pension fund and its governing body. Because of this, redress for professional negligence is sought through the court rather than addressed through punitive sanctions by the supervisor. In contrast, **the use of actuarial professionals in the auditing process is minimal.** In cases where the calculations and reviews are used, they are often used as a reference point for conducting the audit of a scheme and to inform the auditor's opinion. **In relation to the supervisor, the actuarial professional's responsibilities are mostly to fulfil reporting requirements,** which also include an obligation to whistle-blow if it is determined that the fund may be at risk. This means that whistle-blowing, as it does for insurance entities, exists in pension funds.

37. In whistle-blowing, an actuarial professional has a direct reporting line to the supervisor when he/she realises that there are issues that need special supervisory intervention in order to be rectified, or that should be required to be rectified by the pension fund managers, trustees or other governing body. Core Principle 6 on Governance (OECD, 2009) explicitly specifies that in occupational plans an actuary should indeed act as a whistle-blower, and that their role is to report to the pension supervisors if the plan's governing body does not take appropriate actions. It reads:

As soon as the actuary realises, on performing his or her professional or legal duties, that the fund does not or is unlikely to comply with the appropriate statutory requirements and depending on the general supervisory framework, he or she shall inform the governing body and -- if the governing body does not take any appropriate remedial action – the supervisory authority and other appropriate persons without delay. (Implementing Guideline 6.7).

38. In a similar vein, the *OECD/IOPS Good Practices for Pension Funds' Risk Management Systems* (2011) stipulate that “third parties, such as external auditors, actuaries and custodians, should be independent and have whistle blowing responsibilities” (Good Practice 6: Control and Monitoring Mechanisms).

IV.4. Actuarial professionals: approval and fit and proper requirements by pension supervisors

39. Countries are quite divided with regard to actuarial professionals being approved by the supervisor. In many countries, the nomination of actuarial professional does not need to be approved by the supervisor, whereas in almost as many countries the supervisor has a direct say on the issue. In some cases, the fund must inform the supervisor of the appointment of an actuarial professional and the supervisor has the power to disallow that appointment on the basis of certain factors. Where the supervisor does not oversee the appointment of actuarial professionals, the supervisor has the power to require the removal of the actuarial professional under circumstances where it is deemed necessary.

⁹ Or more precisely – by its managing entity or governing body. In the rest of the paper, we use the expression “pension fund” whenever when we talk about decision-makers.

40. **In most jurisdictions, there are no direct fit and proper requirements for actuaries.** However, where these requirements do exist, they are usually connected to criminal records or to issues of conflict of interest. Somewhat related to the issue of fit and proper requirements is that professionals undertaking calculations and reviews should adhere to professional standards when professional bodies operate in a certain jurisdiction.

IV.5. Importance of actuarial calculations and reviews in pension schemes

41. **In DC funds/schemes, there is substantially less need for actuarial calculations and reviews.** With the information gathered, it is possible to say that these are needed only when the plan has some guarantees or when the fund directly pays out annuities. However, as already mentioned, it should be noted that the importance of actuarial professionals in DC funds might increase if there becomes a focus on target retirement issues (see IOPS, 2015) or when there is a regular information disclosure to the plan members regarding expected benefits.

42. Further, the survey determined that a crucial role for actuarial calculations and reviews was in providing reassurance to the supervisory authority that a fund is properly run and financially sound. We also found that calculations and reviews are not only needed in the actual valuation of a pension fund, they are also needed at least in risk management, especially in DB and hybrid schemes. Also important were: the authenticity (veracity) of the assumptions used in the reviews, the plan design and the valuation of pension obligations by the actuarial professional.

43. Specifically, looking at the role of calculations and reviews in pension supervision generally, the following aspects can be pointed out:

- (a) establishing the financial position of a pension fund;
- (b) ascertaining the level of fund assets in meeting obligations;
- (c) analysing the long-term financial stability of the fund;
- (d) assessing, where appropriate, the solvency of the fund;
- (e) recommending on sustainability and on the level of employer contributions to maintain sustainability; and
- (f) in some cases also performing a risk management.

IV.6. Importance of actuarial calculations and reviews in risk management

44. The survey examined the importance of risk management for a pension scheme as it was perceived by the supervisors as well as the actuaries. In particular, it looked at three areas of risk management: controlling and compliance with best practice risk management, identification of critical risks and how a plan would cope quantitatively over a five to ten year period.

45. Using a broad-brush approach, we found **no really significant differences in the importance of the calculations and reviews** in the three areas, as all were deemed as very important to a pension scheme. But, we saw that **those countries with purely DC schemes placed less emphasis** on the importance of the calculations and reviews in risk management.

IV.7 Potential supervisory challenges with regards to the conduct or role of the actuarial professional

46. Generally, problems with the role and conduct of the actuarial professional were not evident across all jurisdictions. However, among supervisors who responded, there seemed to be some consensus with respect to the potential, or actual, areas in which problems (could) arise. These include:

- (a) Quality of actuarial assumptions: The issue reported here is where the assumptions made could be overly optimistic, overly conservative or lack justification. Making poor/unreliable assumptions may result in calculation errors and affect the value of benefits and contributions.
- (b) Technical language: The use of technical language and jargon which may not be easily understood by various stakeholders results in important and very intricate details of the calculations and reviews being lost to its intended audience.
- (c) Inaccurate information/performing calculations on the basis of incorrect information: Using incorrect or unreliable information results in imprecise or misleading calculations. Further, not paying particular attention to statutory requirements may result in violations of law and the use of incorrect bases (in cases where guidance is provided) for calculations.
- (d) Lacking responsiveness: Lacking reaction to the changing economic environment/circumstances of the fund and not responding to market shocks which potentially change the circumstances of the fund are high risks to members (although, at least for the beneficiaries in some countries, additional security mechanisms, such as pension protection schemes, exist in case pension funds cannot provide the guaranteed benefits or when the sponsor defaults).
- (e) Independence of the actuarial professional: A lack of independence and the existence of conflict of interests include trade-off in decisions when, for example, an actuarial professional is engaged by both a pension fund as well as a sponsor of a pension fund. Reporting (related to independence) is also an issue. An actuarial professional may recognise, but fail to report, serious problems. This may result in inadequate reporting and possible failure to abide by any whistle-blowing legislation in place.
- (f) Adequacy of actuarial resources: An insufficient number of actuarial professionals in a jurisdiction feeds into all the other problem areas as it could lead to a professional becoming overstretched due to the demands from a particular industry or between industries.
- (g) Lack of timely information: A related problem is a situation when the information is not available on time. Failure of the actuarial professional to provide timely reports, of calculations and reviews, can undermine the work of the supervisor, as information that is not timely may also inhibit or delay regulatory or supervisory action where necessary.
- (h) Neglecting statutory requirements and legal changes: Such a situation may occur when an actuarial professional does not engage in continuous professional development.

47. The actuarial associations are aware of these problems and take them into account while drafting their rules of professional ethics. Nevertheless, supervisors still have to make sure that these rules are actually applied and therefore actuarial professionals need to have clear regulations on deadlines, disclosure of sources and actuarial assumptions and transparency of their recommendations.

V. Conclusions

48. This research reconciles the interests of the supervisors with the performance and role of the actuarial professional in the supervision of pension schemes. In general, we found that the calculations and reviews generated from the use of actuarial methodologies are of demonstrable significance to pension supervisors in undertaking their monitoring and gatekeeping functions in the pension industry. The use of calculations and reviews in assessing the financial health of a pension fund cannot be overstated, and the research provides solid evidence of this fact. This is in line with the *OECD Recommendation on Core Principles of Occupational Pension Regulation* (2009).

49. Professionals undertaking calculations and reviews do their best to create the information needed to analyse the issues mentioned in paragraph 43. As stated in paragraph 6, “actuarial calculations and reviews” refer to calculations using actuarial mathematics or actuarial methodologies as opposed to calculations solely undertaken by [qualified] actuaries. In many contexts mentioned above, it was clear that calculations and reviews are needed more in DB arrangements and less in DC, especially when DC plans do not mandate, or at least offer, the payment of benefits in the form of annuities.

50. While the use of calculations and reviews were obvious as they relate to DB and hybrid schemes, the primary discrepancy found was the ambiguity amongst the respondents surrounding the use of the calculations and reviews in the governance and supervision of DC schemes. Its usefulness in these schemes was less clear. With the global emergence of a greater number of DC funds, perhaps the practicality of actuarial methodologies in achieving (or bolstering) supervisory objectives for these schemes should be tested, though it may seem counterintuitive.

51. It also became clear that supervisors and professionals undertaking calculations and reviews generally do not have conflicting aims. Calculations and reviews in pension supervision are used for the issues listed in paragraph 43. Supervisors need these analyses and thus appreciate the calculations and reviews. The interests of both parties seem to be fairly well aligned. This is strengthened in some cases with requirements intended to make conflict of interest unlikely.

52. Calculations and reviews play a critical role in the supervisory decision-making process and in putting the supervisors in an informed position to make targeted, well-reasoned decisions in their assessments of pension funds. The survey determined that a crucial role for the actuarial calculations and reviews was in providing reassurance to the supervisory authority that a fund is properly run and financially sound (cf. paragraph 42). They are used when monitoring pension funds’ compliance with the relevant legislation, establishing the financial health of a pension fund, as well as in determining and managing the risks to beneficiaries. Supervisors need actuarial professionals to produce calculations and reviews that are sound and that use relevant assumptions and give reasonable projections. The fact that supervisory authorities articulated this need demonstrates that they are within the *Good Practice* guidelines promulgated by both the IOPS as well as the OECD (OECD/IOPS, 2011).

53. It was also clear that there is no universal requirement to have *fully qualified* actuaries (in the IAA sense of the concept) to perform calculations and reviews. There seemed to be less need for formal competence in the area of DC plans. There is typically more appetite for calculations and reviews in the context of DB and hybrid schemes than in the context of DC schemes. Often, this consists of the valuation of technical provisions according to prescribed methods and reporting in a certain form with a certain content base. In many cases, calculations and reviews are used to evaluate contribution rates and to assess the long-term adequacy of the fund in meeting its future obligations.

54. As there does not seem to be a pervasive tendency to have fully qualified actuaries undertaking calculations and reviews, supervisors should exercise caution and ensure that those engaged by pension

funds have the required competence and that they follow generally accepted standards of practice in undertaking services for the pension funds that engage them. While other specialists may be used (in keeping with the OECD Recommendation on Core Principles), they should be suitably qualified for the work they are engaged to perform and/or possess the relevant experience so as to minimise risk exposure to the fund due to professional negligence or lack of knowledge in the area.

55. Supervisors also reported on the main problems they had (or could have) with the work of an actuarial professional. While several problems were reported and can generally be placed in one of three categories – problems with diligence (paragraph 46, a–d, and by some means, paragraph 46, g), problems with personal requirements (paragraph 46, e–f) and problems with professional requirements (paragraph 46, g–h), the two issues that seemed to be the most prominent across jurisdictions are the actuarial professional’s decisions with respect to the assumptions used in reviews and calculations and independence of the actuarial professional.

56. Emerging fields in the area of calculations and reviews are their use in supplying better information for plan participants and how these reviews can be used in advanced risk management. In both areas, the challenge to professionals undertaking calculations and reviews is to increase the user friendliness of their output.

PUBLICATIONS RELATED TO THE SUBJECT

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