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Macro- and micro-dimensions of supervision of large pension funds

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IOPS WORKING PAPERS ON EFFECTIVE PENSIONS SUPERVISION

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MACRO- AND MICRO-DIMENSIONS OF SUPERVISION OF LARGE PENSION FUNDS

Kyoung Gook Park*, Dariusz Stańko*

ABSTRACT

This paper focuses on the supervision of large private pension funds (LPFs) and their potential impact on financial markets and the economy. The report is based on a survey of 34 members of the International Organisation of Pension Supervisors (IOPS). In many jurisdictions the large pension funds are on a par with big banks and insurance companies in terms of pension customers and savings under management. There are two dimensions to the supervision of LPFs. The macro dimension focuses on guarding against the potential adverse impact of such funds on financial markets and the overall economy, whereas the micro-dimension is about the possibility that inappropriate governance and operations of the LPFs may bring harm to the well-being of many pension beneficiaries and pension sponsors, norms of pension funds' market conduct, and even to the orderly operation of supervisory bodies.

In the macro-dimension perspective, the overall view of the responding IOPS supervisors is that large pension funds contribute to financial and economic stability. This is mainly due to their asset allocation practices and the stability of cash flows, reasonably uncorrelated with the situation in financial markets. The supervisors assessed that counterparty risk, investment concentration, and stop loss/fire sale channels are most likely channels through which shocks from distressed LPFs may be transmitted to the financial system. In their view, distress at large pension funds may dent public confidence in social systems and the prospects for retirees.

LPFs might also require supervisory importance in the micro-dimension as they generally have more financial and operational resources (such as staff and IT systems) than smaller funds. Therefore, they are more likely to be involved in more sophisticated investment activities. Large funds play a leading role in pension fund management and operational practice. Among the various micro-dimensional aspects of the supervision of these funds, the responding IOPS supervisors in general put more emphasis on such aspects as risk management, investment, governance, internal control, stress testing and contingency plans, market concentration and competition, and supervisory resource allocation.

The report addresses the question of whether it is necessary to explicitly identify systemically important pension funds based on international or domestic standards and apply special regulatory or supervisory guidelines for them. Although some diverging opinions were revealed, supervisors tended to believe that before answering this policy question, some more evidence on the influence of pension funds on financial markets would be needed. The identification and

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creation of global standards for LPFs seem to be difficult as the features and impact of such funds tend to vary depending on the jurisdiction. Supervisors expressed some more support for the identification and monitoring of pension funds that are important domestically.

The report suggests a follow-up study of other identification categories such as interconnectedness, substitutability, complexity, and cross-jurisdictional activities to assess the systemic impact of large pension funds in quite a distinct context. Such an exercise, possibly a joint study with the FSB and other key organisations in the field, could be undertaken in the future.

Keywords: financial markets, large pension funds, pension supervision, systemic importance, financial stability

JEL codes: G-18, G-23, G-28, G-34

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MACRO- AND MICRO-DIMENSIONS OF SUPERVISION OF LARGE PENSION FUNDS

I. Introduction

As major institutional investors, pension funds invest a large amount of assets on behalf of numerous pension beneficiaries and sponsors. With their fast-growing assets resulting from the aging population and increasing life expectancy, pension funds are becoming more important than ever in terms of their potential impact on pension participants, financial markets, and the economy in general. This trend leads to the consideration of the necessity of a special supervisory approach to large pension funds.

Pension funds manage almost as much wealth in assets under management as the insurance sector. Moreover, pension funds are growing faster than any other financial services sector. As of 2015, the total investments of private pension funds in OECD countries were worth USD 24.8 trillion. Pension plans account for 26.7% of the total assets of the main institutional investors in OECD countries as of 2013, which was USD 92.6 trillion. The average annual growth rate of pension fund assets was 8.2% during the period from 2009 to 2013, which exhibits much higher growth rate than 6.7% of investment funds and 4.1% of insurance companies (OECD, 2014, 2015c, and 2016b).

One can obtain a better picture of the importance of pension funds in economies by looking at the ratio of pension investments as a percentage of country GDP. Figure 1 shows the statistics for the OECD countries (panel A) and for the majority of the IOPS member jurisdictions (panel B). Among the IOPS members, in 2015 pension funds in four jurisdictions¹ exceeded 100% of their GDP, and in another eight² they ranged between 50% and 100%. The relative size of pension fund assets to GDP in a particular jurisdiction suggests not only the importance of pension funds in that economy, but also the magnitude of the potential impact that pension funds might have on the economy in general.

Some of the largest pension funds are as large as big banks and insurance companies in terms of assets under management. In the recent OECD 2015 Annual Survey of Large Pension Funds (OECD, 2016a), the largest 50 pension funds among the sample range from USD 3.2 billion to USD 473.6 billion in total investments or assets. The largest pension fund in the reporting IOPS member jurisdictions has total assets of USD 194.1 billion as of end of 2014, which is about the same size as the world's 42nd largest insurance company³, and the 118th largest bank⁴. Figure 2 presents the 30 largest funds in the reporting IOPS member jurisdictions and the U.S.

With the strong presence of pension funds in the economy and the large number of related parties including pension beneficiaries, pension sponsors, investment counterparties, and supervisors, there is no doubt that it is important for the pension supervisors to appropriately supervise large pension funds.

From the perspective of financial stability, 'large' means 'with significant potential impact on financial stability'. Following the recent global financial turmoil, the Financial Stability Board (FSB) and international financial supervisory bodies, such as the Basel Committee on Banking Supervision (BCBS), the International Association of Insurance Supervisors (IAIS), and the International Organisation of

¹ Australia, Iceland, the Netherlands, and Switzerland.

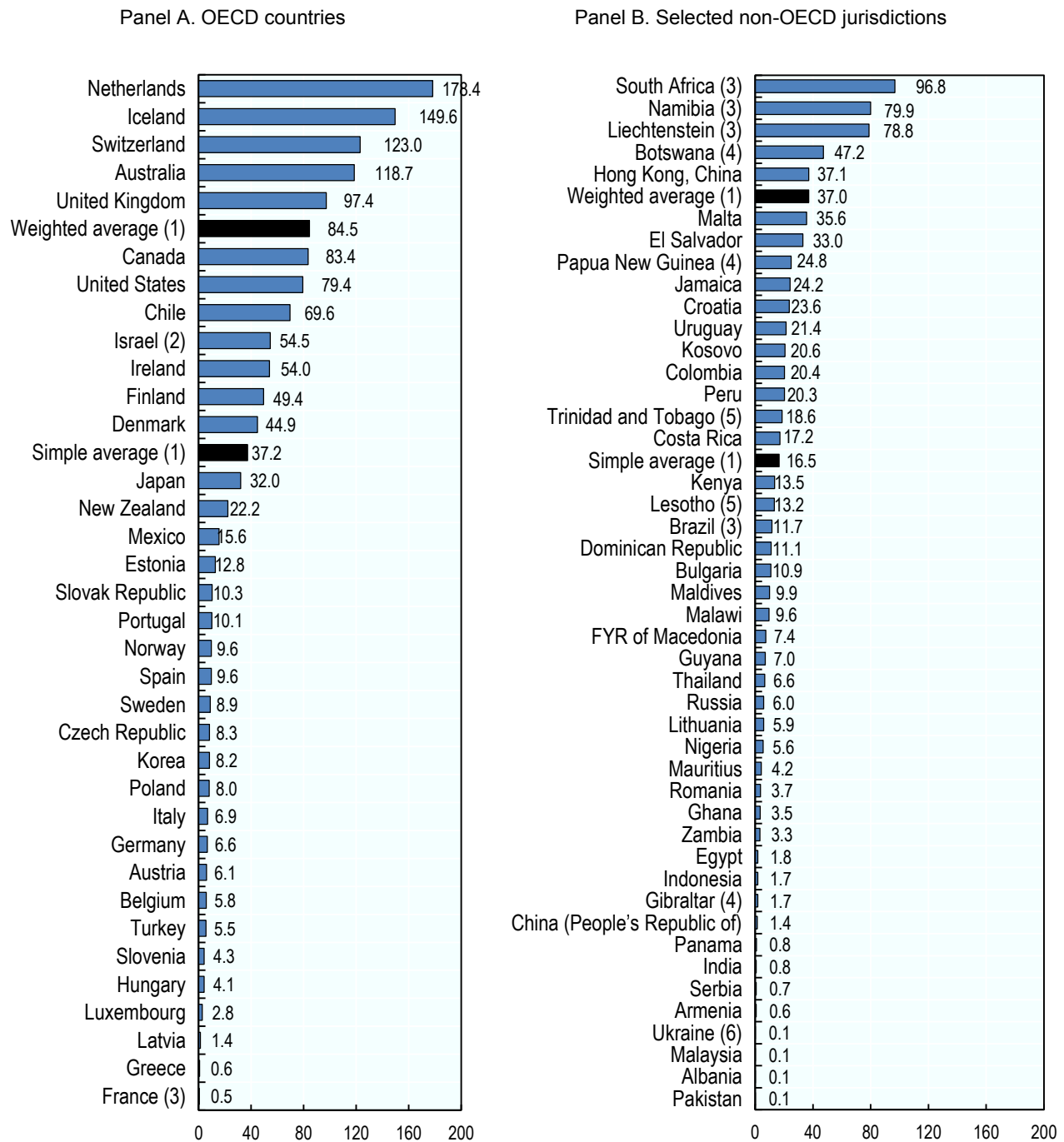
² Canada, Chile, Ireland, Israel, Liechtenstein, Namibia, South Africa, and the United Kingdom.

³ <http://www.relbanks.com/top-insurance-companies/world>, site accessed in May 2017.

⁴ <http://www.relbanks.com/worlds-top-banks/assets>, site accessed in May 2017.

Security Commissions (IOSCO) have been trying to set internationally agreed rules to identify global systemically important financial institutions, so called G-SIFIs.

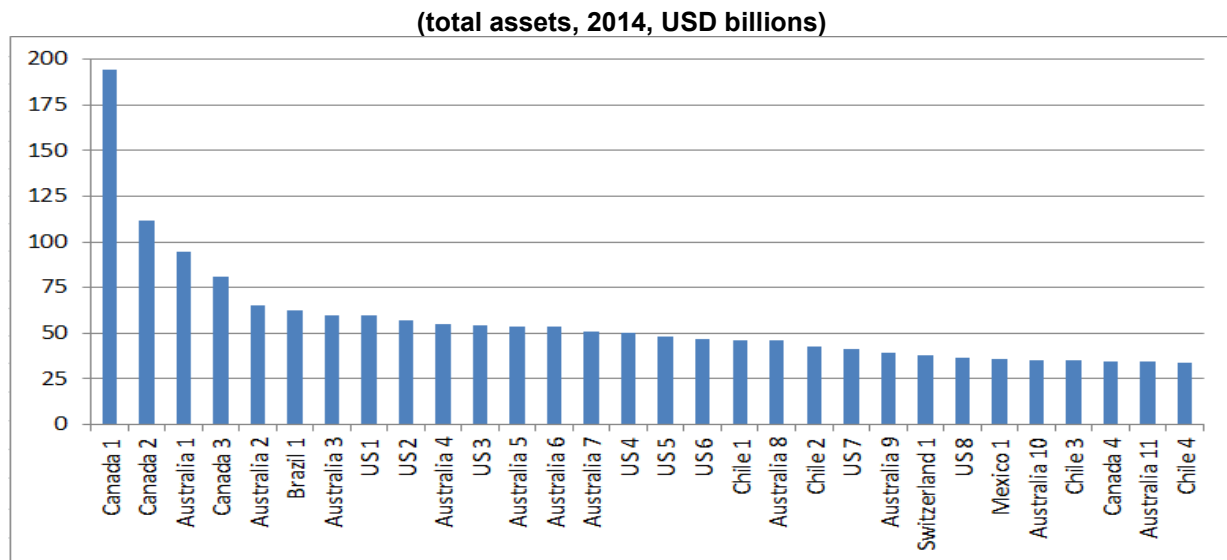
Figure 1. Importance of pension funds by their relative size to the economy (% GDP, 2015)



Notes: (1) Data refer to the weighted (by total investments) and simple average of the ratio of pension fund investments to GDP in the respective area. (2) Data refer to old, new and general pension funds. (3) Data refer to 2014. (4) Data refer to 2013. (5) Data refer to 2012. (6) Data refer to 2011.

Source: Pension Markets in Focus, OECD (2016b).

Figure 2. Thirty largest pension funds in the reporting IOPS members and the U.S.



Source: Reporting IOPS member jurisdictions and the U.S. Department of Labor.

The approach for identifying G-SIFIs is a kind of scorecard method. The selected indicators of systemic importance are classified into five categories, and then the indicators are summarised by their assigned weights into a final score upon which G-SIFIs are identified. The five categories are: size, interconnectedness, substitutability, complexity (for insurers, non-traditional and non-insurance activities), and cross-jurisdictional activities (for insurers, global activities). Each category has one to seven indicators, and the indicators are different for each financial sector in order to represent the uniqueness of the sectors (Yuksel, 2014, see Table A1).

Identification methods for G-SIFIs are agreed and implemented in the banking and insurance sector, while the methods for non-bank and non-insurance financial institutions were in the consultation process by the Financial Stability Board and the International Organization of Securities Commission at the moment of drafting this paper. In the second consultative document dated 4 March 2015, FSB and IOSCO suggested identification frameworks for Non-Banking Non-Insurance Global Systemically Important Financial Institutions (in short, NBNI G-SIFIs) in three business sectors; finance companies, market intermediaries (securities broker-dealer), and investment funds. The FSB and IOSCO excluded pension funds from the NBNI G-SIFI group arguing that, firstly, pension funds “pose low risk to global financial stability and the wider economy due to their long-term investment perspective” and, secondly, that “pension funds are in general also covered indirectly through contractual relationship with asset managers or use of investment funds”.

A recent publication of the FSB acknowledges pension funds’ relatively low systemic risk and even stabilising role by mentioning that “pension funds generally have long-term investment horizons and make a positive contribution to financial stability. They also generally have relatively low levels of liquidity transformation and financial leverage” (FSB, 2017)⁵. However, in its preliminary analysis results, the FSB also pointed out four areas of potential vulnerabilities of pension funds. These are: potential for liquidity risk in some types of DC pension funds (by allowing members to withdraw from or switch funds at very short notice); reach for yield (by investing more into higher-risk credit securities and/or alternative assets);

⁵ <http://www.fsb.org/2017/01/policy-recommendations-to-address-structural-vulnerabilities-from-asset-management-activities/>, site accessed in May 2017.

potential build-up of leverage (by, for example, engaging in leveraged strategies as part of liability-driven investment strategies); and use of derivatives (to enhance returns) and longevity risks (to reduce longevity risk exposure), which may imply a need for better management of counterparty risk and interconnectedness in the financial system. The FSB also stated that pension funds' financial stability risks "may be better addressed when the FSB revisits the scope of NBNI G-SIFI assessment methodologies, which will be conducted jointly with IOSCO".

The aim of this paper is to investigate how large pension funds (LPFs) may influence the financial markets and the economy as a whole; what are the views of pension supervisors on the potential impact of large pension funds and on the mechanisms (transmission channels) through which LPFs may interact with the financial markets; as well as what strategies and approaches the supervisors should adopt to address potential macro- and micro impacts that large pension funds may make.

The paper covers the issues related to large private pension funds (LPFs), either domestically or internationally, that are supervised by the IOPS members. A questionnaire was used as the main tool for collecting information on the IOPS member jurisdictions' practices, experiences, and views. In total, 34 jurisdictions replied to the questionnaire⁶, and two jurisdictions provided some partial quantitative data for the project⁷. In this vein, the paper presents views of pension supervisors on various aspects of supervision of large pension funds and on possible impact the LPFs may have on financial markets and the economy. The study also reviews some of the empirical research literature with regard to the impact of pension industry as a whole on financial markets.

This paper focuses on the supervision of private large pension funds and the potential impact of these entities on financial markets and the economy. However, the study does not address the concept of financial stability, as defined by the FSB and IOSCO. It employs only one category (i.e. size) from the FSB and IOSCO's toolkit for identifying G-SIFI institutions. The IOPS definition of size focuses on both absolute and relative aspects. The second category, interconnectedness, is reflected only partially by the IOPS size definitions B-2 and B-3 that look into funds' holdings of bonds and equities to account for funds' relative importance in these markets (cf. section IV.1). The direct application of other G-SIFI categories to the pension funds industry would call for an additional study. Also, any issues of pension funds and financial stability that the IOPS may wish to address in the future would be considered in close co-operation and interaction with the Financial Stability Board.

There are different dimensions that the pension supervisors have to consider regarding large pension fund supervision. For example, distressed LPFs or even their regular behaviour can cause an adverse impact on financial markets and the overall economy. In this working paper, we refer to this aspect as a '*macro-dimension*' of supervision on large pension funds. As another example, distress or inappropriate governance of LPFs may bring harm to the well-being of many pension beneficiaries and pension sponsors, norms of pension funds' market conduct, and even to the orderly operation of supervisory bodies. We refer to this second aspect as a '*micro-dimension*' of supervision of large pension funds. The IOPS has already done substantial work on various micro-dimensions of pension supervision⁸. Given the potential impact of large pension funds, it would be worthwhile to question how the micro-dimensions of supervision on LPFs

⁶ Armenia, Australia, Austria, Brazil, Bulgaria, Canada, Chile, China, Colombia, Hong Kong China, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Kenya, Lithuania, Macedonia, Mauritius, Mexico, Namibia, Portugal, Romania, Russia, Serbia, Slovak Republic, Spain, Switzerland, Tanzania, Trinidad and Tobago, Turkey, Uganda, and the UK.

⁷ South Africa (IOPS member) and U.S. (Department of Labour, non-IOPS member).

⁸ <http://www.iopsweb.org/iopsworkingpapereffectivepensionsupervision.htm>, site accessed in May 2017.

are (or should be) different from those on non-LPFs in order to deepen our understanding of pension supervision.

Due to the different nature of pension funds compared to banks or insurers, the concept of immediate bankruptcy or failure may not be directly applicable to pension funds. Depletion of the capital position, which often constitutes ‘bankruptcy’ or ‘failure’, is not easily defined in pension funds. In this regard, we use the word ‘distress’ in this paper instead of ‘bankruptcy’ or ‘failure’ when we refer to the situation where LPFs create adverse macro or micro-dimensional supervisory issues.

The paper is organised as follows. Sections II and III present an analysis of views of responding IOPS supervisors on, respectively, macro- and micro-dimensions of supervision of large pension funds. The discussion in these sections refers to a generic concept of large pension funds. Section IV provides an overview of the landscape of domestically and globally large pension funds in the IOPS member jurisdictions in line with the working definition used. Section V summarises some of the empirical work conducted in the area of the impact of the pension sector as a whole on financial markets. After discussing whether it is necessary to develop special regulatory or supervisory guidelines for the systemically important pension funds in Section VI, the last section concludes.

II. Macro-Dimensional Supervision of LPFs

Pension funds are one of the major types of institutional investor, and hold a significant share of investment in the financial markets. They provide long-term funding to corporations via investment in stocks and bonds, and they help the capital market to be more liquid by means of a steady flow of contributions from pension beneficiaries and sponsors. Another stabilising effect results from their steady long-term asset allocation. On the other hand, however, pension funds could possibly act as a somewhat destabilising force on capital markets if the pension sector in general is in its decumulation phase because the gradual liquidation of their assets during financial turbulences may additionally exert “fire sale” pressure.

Moreover, due to their size, the distressed behaviour of large pension funds, or sometimes even their regular behaviour, may have a direct and/or indirect impact on the financial markets and the economy in general via various transmission channels. Apparently, these transmission channels are also relevant to the overall pension sector⁹, not only to LPFs, especially if smaller funds behave similar to one another, therefore creating a larger influence on financial markets. However, with LPFs’ significance in the pension sector, concentration of risks due to their size of investments, and leading role in the pension sector, LPFs often draw special attention from the supervisors. The discussion that follows below refers to a generic concept of large pension funds, not necessarily to the IOPS definition used for the purpose of this study.

II.1. Macro-dimensional supervisory practice

Who supervises the macro-dimensions?

While the majority of the jurisdictions (22 out of 34) have the same supervisors for the macro-dimension and micro-dimension of pension supervision, twelve jurisdictions (Australia, Bulgaria, Canada, Chile, China, Iceland, Jamaica, Macedonia, Portugal, Russia, Uganda, and the UK) reported that there are other organisations involved in the macro-dimensional supervision (Table 1). In many cases, the central banks and ministries of finance participate in macro-dimension supervision.¹⁰ In Australia and Chile, three

⁹ In this respect, the commercial asset managers may also be treated as a major transmission channel.

¹⁰ There are cases where the central banks are involved in macro-dimensional pension supervision with the responsibility of monitoring financial stability without explicit legal responsibility for pension supervision.

different organisations are involved in both the macro and micro-dimensions of pension supervision (see Box 1. for the Chilean case).

Table 1. Supervisors of macro and micro dimensions in selected jurisdictions

	Macro Dimension Supervision	Micro Dimension Supervision
Australia	<ul style="list-style-type: none"> • The Australian Prudential Regulation Authority (APRA) • The Reserve Bank of Australia • The Council of Financial Regulator 	<ul style="list-style-type: none"> • The Australian Prudential Regulation Authority (APRA) • The Australian Securities and Investments Commission (ASIC) • Australian Taxation Office (ATO)
Bulgaria	<ul style="list-style-type: none"> • Parliament (National Assembly) • Ministry of Finance 	<ul style="list-style-type: none"> • The Financial Supervision Commission (FSC)
Canada	<ul style="list-style-type: none"> • The Department of Finance (federal) • Ministry of Finance (or other ministry) for each province • Canada Revenue Agency • Bank of Canada 	<ul style="list-style-type: none"> • Canadian Association of Pension Supervisory Authorities (CAPSA) and the regulators or supervisory agencies in each province • Canada Revenue Agency
Chile	<ul style="list-style-type: none"> • Superintendence of Pensions (SP) • The Central Bank of Chile • Financial Stability Council (CEF) 	<ul style="list-style-type: none"> • Superintendence of Pensions (SP) • Technical Investment Council (CTI) • Risk Classification Commission (CCR)
China	<ul style="list-style-type: none"> • China Insurance Regulatory Commission (CIRC) • Ministry of Human Resources and Social Security 	<ul style="list-style-type: none"> • China Insurance Regulatory Commission (CIRC)
Iceland	<ul style="list-style-type: none"> • The Financial Supervisory Authority (FME) • The Central Bank of Iceland 	<ul style="list-style-type: none"> • The Financial Supervisory Authority (FME)
Jamaica	<ul style="list-style-type: none"> • The Financial Services Commission (FSC) • The Bank of Jamaica • The Financial Regulatory Committee (FRC) 	<ul style="list-style-type: none"> • The Financial Services Commission (FSC)
Macedonia	<ul style="list-style-type: none"> • Agency for Supervision of Fully Funded Pension Insurance (MAPAS) • The National Bank of Republic of Macedonia 	<ul style="list-style-type: none"> • Agency for Supervision of Fully Funded Pension Insurance (MAPAS)
Portugal	<ul style="list-style-type: none"> • Portuguese Insurance and Pension Funds Supervisory Authority (ASF) • Bank of Portugal 	<ul style="list-style-type: none"> • Portuguese Insurance and Pension Funds Supervisory Authority (ASF)
Russia	<ul style="list-style-type: none"> • The Central Bank of Russia • Ministry of Labour and Social Protection 	<ul style="list-style-type: none"> • The Central Bank of Russia

Such an example is the National Bank of Republic of Macedonia (NBRM). The bank collects relevant data from other financial supervisory authorities, and prepares periodical publications related to the financial system stability.

Uganda	<ul style="list-style-type: none"> Ministry of Finance 	<ul style="list-style-type: none"> Uganda Retirement Benefits Regulatory Authority (URBRA)
United Kingdom	<ul style="list-style-type: none"> The Pension Regulator (TPR) Financial Conduct Authority (FCA) Bank of England 	<ul style="list-style-type: none"> The Pension Regulator (TPR)

Source: IOPS.

Box 1. Macro and micro-dimension supervision framework on pension funds in Chile

Macro-dimensional supervision

- Superintendence of Pensions (SP): It is the legal entity created to safeguard pension funds through an appropriate regulatory framework and the subsequent enforcement of rules. Thus, it regulates Pension Fund Administrators in micro and macro terms.
- Central Bank of Chile: It is the institution responsible for promoting stability and effectiveness of the Chilean financial system. It constantly monitors the evolution of the pension system and has the power to permit or prohibit acquirable instruments as investments and to set structural limits within the range established by law.
- Financial Stability Council (CEF): Its aim is to ensure the integrity and soundness of the financial system, through a preventive management of systemic risk. Its members are the Ministry of Finance, the Superintendent of Securities and Insurance, the Superintendent of Banks and Superintendent of Pensions.

Micro-dimensional supervision

- Superintendence of Pensions (SP): It regulates Pension Fund Administrators in micro and macro terms.
- Technical Investment Council (CTI): It is an independent body made up of members from different institutions, whose job is to issue a technical opinion on the content of the Investment Regime (which is the secondary regulation with explicit investment limits) and on the amendments proposed by the SP, trying to achieve an appropriate return and security for pension funds.
- Risk Classification Commission (CCR): It is an entity formed in order to approve or reject investment instruments, evaluate risk ratings and establish their specific investment approval procedures.

Source: Superintendence of Pensions, Chile.

How pension supervisors monitor the potential impact of LPFs on financial markets

Many of the responding authorities perform financial stability analysis at the level of the pension financial sector as a whole to assess macroeconomic impact regularly or irregularly. Some such examples are provided below. It seems that there is no case where financial stability analysis related to the LPFs only is performed separately on a regular basis.

- *Australia:* The APRA and the Reserve Bank of Australia developed Macro Prudential Analysis and Policy in the Australian Financial Stability Framework. Financial stability is analysed together with other financial sectors. APRA has a set of systems, tools and processes that monitor industry trends and potential industry risks, including those in respect of large pension funds. The key elements of this framework include an Industry Risk Management Framework, an Industry Analysis Team, and Industry Groups and Industry Risk Registers.
- *Bulgaria:* The economic impact of the pension funds activity is analysed on an ad hoc basis and more at the industry level than as separate entities.
- *Canada:* The Bank of Canada analyses the resilience of the Canadian financial system in its Financial System Review (FSR)¹¹. This review sometimes includes an analysis of the activities of large public pension plans.¹²

¹¹ <http://www.bankofcanada.ca/publications/fsr/>, site accessed in May 2017.

- *Chile:* The Superintendence of Pensions (SP) receives and analyses daily movements and investments of all pension funds, by which it can detect and track changes that may have effects on the economy. In addition, the Financial Stability Council (CEF) meets every month to analyse the economic and financial situation in the country and to identify potential external or internal risks that could threaten the stability. In this instance, the influence of pension funds is also analysed within the economic and financial context.
- *Hungary:* The influence of the pension fund sector on financial or economic stability is analysed in every half year as a part of the Financial Stability Report.
- *Israel:* The influence of large pension funds on financial or economic stability is analysed as part of the asset portfolio analysis.
- *Jamaica:* The data on the entire pension industry is compiled quarterly and industry-level analysis presented to the Financial Regulatory Committee (FRC). The FRC evaluates linkages between the different regulated financial sectors and coordinates action to address the impact of any risk exposures. The pension supervisor, FSC, is a member of the FRC.
- *Mexico:* The National Commission for the Pension System (CONSAR) performs various regular analyses and irregular special analysis on the influence of pension funds on financial stability (see Box 2. for details).
- *Romania:* Financial stability is analysed together with other financial sectors.
- *Switzerland:* Systemic risks are assessed in the context of the supervision of the Swiss Guarantee Fund.
- *Trinidad and Tobago:* The private occupational pension plans sector's assets are reviewed as part of the Central Bank of Trinidad and Tobago (CBTT)'s annual reporting on the financial sector (investment activity, GDP growth etc.) and financial stability. Additionally, the impact of macroeconomic conditions on the solvency of all pension plans is reviewed and reported to the CBTT's Board of Directors quarterly.
- *United Kingdom:* The Bank of England occasionally reports on pension fund activity and its impact on financial stability.

¹² 'Large Canadian Public Pension Funds: A Financial System Perspective', June 2016, Bank of Canada. (<http://www.bankofcanada.ca/wp-content/uploads/2016/06/fsr-june2016-bedard-page.pdf>, site accessed in May 2017.)

Box 2. Macro-supervision on pension funds in Mexico

1. Analysis of influence of pension funds on financial stability

CONSAR elaborates periodic reports regarding:-

- The buy/sell daily activities of pension funds with the financial instruments allowed.
- Special attention is paid to operations in the Mexican foreign exchange market, government securities and Mexican Stock Exchange and the usage of derivatives.
- Weekly stress tests of pension funds' portfolios. This is also performed by the Central Bank and the Mexican Commission of Banking and Securities (equivalent to the SEC in the USA), and are presented in the Mexican Stability Committee every two months.
- Monthly report of portfolios position through derivative instruments.
- Investments in IPOs (equity, REITs, alternatives) and fixed income new issuances.

CONSAR has prepared on demand, the following:-

- Analysis of the effects of pensions funds activities in the 2007-2009 financial crisis.
- Analysis of the liquidity of pension funds' portfolios.
- Analysis and follow-up of pension funds' strategies in the Mexican government securities' market.

2. Experience of distress in pension sector and actions taken by the supervisor in Mexico

Pension funds were under high stress situation during the global financial crisis of 2007-2009 in Mexico. They faced several challenges: heavy mark-to-market losses, liquidity demand due to derivative positions, a high and noisy number of switches by workers to other pension funds, pro-cyclical regulation, write-offs of some securities, credit downgrades of securities, issuers and guarantees (credit enhancers).

The main measures taken by CONSAR were:-

- Co-ordination with the Ministry of Finance, the Central Bank and the Commission of Banking and Securities, to implement measures to provide liquidity to the markets, to reduce government securities duration (term swaps) and to provide a waiver of the pro-cyclical regulation (risk measures).
- Redefinition of risk measures to eliminate pro-cyclicality.
- Redefinition of settlement dates of incoming cash collections (as a result of workers' periodic contributions) to match with the settlement dates of switches of workers among pension funds.
- Implementation of the Law of Retirement Pension Systems (LSAR) rules regarding exceptional circumstances to waive transitorily the investment regime limits due to external factors (beyond pension funds' control).

Main lessons learned:-

- Make pension funds strengthen their own risk management procedures.
- Implement permanent improvements in regulation (more diversification, elimination of pro-cyclical regulation, match liquidity flows related to contributions collection with withdrawals and switches).
- Follow up on leverage of pension funds through derivative instruments.
- Follow up on pension funds' liquidity net needs.
- Provide stronger encouragement for pension funds to lengthen the horizon objectives of their investments strategies (that would match their commitments' maturities).

Source: The National Commission for the Pension System (CONSAR), Mexico.

II.2. General views on macro-dimensional impact of pension funds and the LPFs

There are well-established beliefs among policy makers, academia, and supervisors that pension funds contribute to financial and/or economic stability in general. The most fundamental forces of pension funds' stabilising effects relate to their asset allocations and pension fund cash flows:-

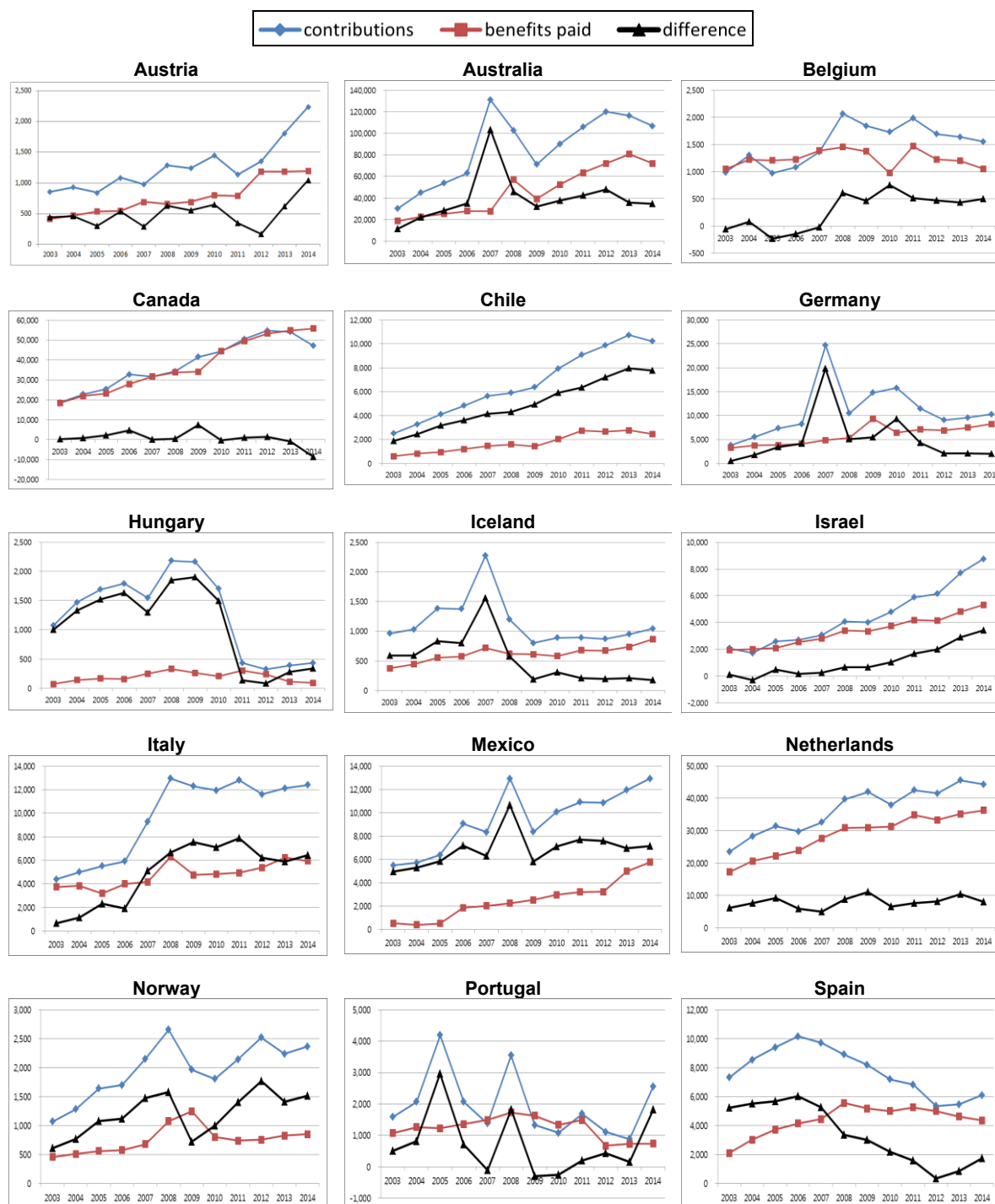
- *Asset allocation*: One of the important sources of pension funds' contribution to the stabilisation of financial markets is the tendency to adhere to their asset allocation targets. Almost all of the responding jurisdictions (32 out of 34) answered that pension funds are required to establish internal asset allocation targets (18 jurisdictions) or are given some external asset allocation targets (nine jurisdictions), or both (five jurisdictions). Among these, pension funds in 28 jurisdictions are monitored by supervisors on compliance with the internal or external asset allocation targets.
- *Pension fund cash flows*: Another important source of pension funds' input to the stabilisation of financial markets is the low correlation of pension fund cash flows (inflows such as pension contributions and outflows such as benefit payments) with the market situation. If these flows were strongly positively correlated with sensitivity to market return, pension funds could have a destabilising effect on financial markets no matter how hard they stick to their target asset allocation. However, if pension funds' cash flows are persistent (i.e. not dependent on the short-term situation in the financial markets¹³) and have a low correlation with the market situation, then one might expect that to some extent pension funds could play a role of liquidity providers in the markets in times when many other investors would rush to reduce their exposure to risky assets.

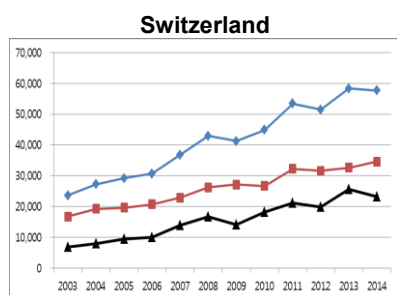
Figure 3 shows pension funds' contributions, benefits paid, and the difference between contributions and benefits paid in selected OECD jurisdictions¹⁴. It can be noticed that contributions were larger than benefits most of the time in most of the observed jurisdictions. This suggests the pension sector was provided with new money to invest in the market even during the period of global financial crisis, 2008-2009. It should be noted, however, that pension funds' capacity of liquidity provision can be limited if a pension sector in general is in its decumulation phase with cash outflows being larger than cash inflows.

¹³ In the long run, the situation on financial markets can have an impact on the economic situation, which could result in changes of contributions level and their timing (due to changes in the unemployment and salary levels).

¹⁴ All of these jurisdictions, except for Norway, are also IOPS members.

Figure 3. Pension funds cash flows in selected OECD jurisdictions (in million USD)





Source: OECD Global Pension Statistics and Austrian FMA (Financial Market Authority).

It can be argued that pension funds reveal fundamental differences from other financial services sectors which could play a stabilizing role. For example, Houwen (2011) points out the following peculiar features:-

- Pension funds are not globally interconnected and are not part of the global financial system – they are only users of the financial system; they do not bring their own products into the financial market - they only invest.
- In some cases, pension arrangements are organised as non-profit institutions, which means they have no funding costs.
- Usually pension fund members do not have much choice whether to be with a pension fund or not.
- Pension savings usually cannot be withdrawn at any time before the statutory retirement age.
- Pension funds tend to have longer investment horizons – also due to their insurance-type nature, as their long-term liabilities and future outflows are known, albeit approximately, decades in advance.

In the IOPS survey, pension supervisors also expressed a similar view regarding the stabilizing role of pension funds (Table 2). According to the responses to the questions on their assessment of the LPFs' macroeconomic impact, the supervisors tend to perceive that the LPFs contribute to financial and economic stability. The average scores for these two questions were 3.8 and 3.7, respectively, out of a possible total of 5. No jurisdiction disagreed with the statement that the LPFs contribute to financial stability, and 19 jurisdictions agreed or strongly agreed with the statement. Solely one jurisdiction disagreed with the statement that the LPFs contribute to economic stability, while 19 others agreed or strongly agreed with the statement.

Table 2. Supervisors' views on LPF's macro-dimensional impact

Large pension funds ...	Strongly Disagree (=1)	Disagree (=2)	Neither Agree nor Disagree (=3)	Agree (=4)	Strongly Agree (=5)	Average
	Number of responding jurisdictions					
- contribute to financial stability	0	0	12	14	5	3.8
- contribute to economic stability	0	1	11	15	4	3.7

- reveal herding investment behaviour that amplifies market fluctuation	2	5	13	8	3	3.2
- contribute to financial instability	6	7	14	4	0	2.5
- contribute to economic instability	6	10	11	4	0	2.4

Note: Average is the average of score points to the statement weighed by the number of jurisdiction that gave their scoring. (Score points: 1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree).

Source: IOPS.

Interestingly, there is a relatively wide split of answers to the statement that the LPFs reveal herding investment behaviour that amplifies market fluctuation. Two jurisdictions strongly disagreed and three others strongly agreed. This divergence might be the result of the jurisdiction-specific experience and characteristics of financial markets. In general, supervisors are only very mildly agreeing that the large pension funds reveal herding behaviours (average score of 3.2).

Experience from the recent global financial crisis also supports this view. The majority of the responding jurisdictions answered that both the large pension funds and pension funds in general did not behave pro-cyclically during the financial crisis in 2008. Only five jurisdictions (Bulgaria, Colombia, Ireland, Israel, and Lithuania) reported that the LPFs behaved pro-cyclically. Nine jurisdictions (Canada, Chile, Hong Kong China, Italy, Jamaica, Namibia, Portugal, Serbia, and Trinidad and Tobago) replied that the large pension funds did not make significant changes in their asset allocation strategies or acted counter-cyclically. Four authorities provided experiences that their pension sector as a whole even actively contributed to recovery from the crisis (Bulgaria, Iceland, Romania, and Switzerland):

- *Bulgaria*: “Although there was a move from shares toward safer investments, the pension funds served as a buffer during the financial crisis of 2008 instead of being a source of any systemic risk, due to the long-term nature of their investments.”
- *Iceland*: “The stock market in Iceland collapsed and positions in domestic companies were reduced by approximately 90%. To build up equity positions, pension funds have been the leading participants in IPOs since 2008 and hold approximately half of listed equity shares.”
- *Romania*: “The pension funds started collecting contributions in 2007-2008, so the financial crisis overlapped with the start of the accumulation period. This allowed pension funds to invest in assets at low prices.”
- *Switzerland*: “The law states explicitly the possibility for a pension fund to be temporarily underfunded (measures to exit underfunding have to be taken at the same time). This is important to avoid a pension fund selling assets with higher risks during a financial crisis, with negative impact on future return and the financial sector as a whole.”

II.3. Short-term perspective: Macro-dimensional impact of LPFs on financial system

This section lists several potential channels through which shocks from the large pension funds may be transmitted to the financial system. Although supervisors in general share views on the stabilizing role of pension funds, they still have some concerns about the potential short-term impact of LPFs' (distressed or normal) behaviour that can be channelled to financial markets.

Potential transmission channels of shocks to financial system

Stop-loss or “fire-sale” channel: Pension fund managers may decide to sell assets that are losing value in a distressed market in order to limit the losses. If the amount of stop-loss sale is large enough, it can contribute to lowering the asset price even further in the financial markets.

Herding behaviour: This type of behaviour by investment managers may cause similar effects even without any explicit stop-loss investment policy. In general, herding itself does not always have a destabilizing effect as long as it contributes to market correction towards the equilibrium price. In this paper, the term “herding” is used in the same context as Bikhchandani and Sharma (2000)’s “intentional herding”. Bikhchandani and Sharma argue that “intentional herding” should be distinguished from “spurious herding”, where “intentional herding” results from an obvious intent by investors to copy the behaviour of other investors and “spurious herding” results when groups facing similar decision problems and information sets take similar decisions. In their view, spurious herding is an efficient outcome whereas intentional herding need not be efficient.¹⁵

Investment concentration channel: With similar investment objectives, investment horizons and liability characteristics, pension funds may reveal a tendency to invest in the same or similar investment choices, which could cause investment concentration risks. Investment concentration can occur at different intensities, such as at security level, firm level, conglomerate level, industry level, country level, regional level. Insufficient diversification can contribute to a weakened resilience of the financial system. However, it is worth noting that many jurisdictions, even those with prudent-person rules, employ various concentration limits to prevent pension funds from taking too much exposure to this type of risk¹⁶.

Forced liquidation or redemption risk channel: In some of the contract-based defined contribution pension funds, participants are allowed to switch from one investment option or pension company to another when they wish. Although the pension fund members with limited financial literacy tend to remain with their default investment option (or their current managing company), in a distressed market they may panic by exercising their option to change, which may mean moving from a portfolio that is losing its value to more safe investments. This, in turn, may force investment managers to liquidate a certain class of assets only to exacerbate the price drop. As another example, in a more severe market condition, participants may decide to take an early lump-sum benefit instead of postponed annuity to preserve their pension asset value or to simply supplement their reduced income.

Counterparty risk channel: Pension funds often use derivatives or structured investment products to mitigate risks or enhance returns. Pension funds may realise passive investment via exchange traded funds (ETFs) constructed with the use of swaps. All these investment products are generally associated with more counterparty risks because of the lack of a centralised market. Although it is widely believed that pension funds have limited outward linkage to the counterparty risk, still, this type of risk can be a contributing factor to forced liquidation. In the case of default by counterparties on these investment products, pension funds may not achieve their intended risk mitigation or return enhancement, and may be forced to liquidate uncovered positions.

Foreign-exchange risk channel: If large pension funds try to reduce their investment in foreign markets, or, if they decide to migrate from risky domestic investment to risk-free foreign investment, these attempts could cause pressure on the foreign exchange market and result in conveying shocks from capital markets to foreign exchange markets.

¹⁵ <https://www.imf.org/external/pubs/ft/wp/2000/wp0048.pdf>, site accessed in May 2017.

¹⁶ Cf. OECD Annual surveys of investment regulation of pension funds, <http://www.oecd.org/daf/fin/private-pensions/annualsurveyofinvestmentregulationofpensionfunds.htm>, site accessed in May 2017.

Security lending and/or Repo channels: Holding a large volume of securities in their portfolio, large pension funds are able to engage in the security lending market as lenders. Security lending is considered to be more pro-cyclical because funding levels are directly related to asset values. Fire sales of collateral securities from defaulted counterparty may cause asset prices to fall leading to potential financial instability¹⁷.

Leverage risk channel: Pension funds are limited in borrowing from outside in general. However, pension funds can be exposed to leverage risk if they invest in leveraged-embedded products or engage in non-hedge derivatives positions, which could amplify the adverse market movements.

Supervisors' views on potential shock transmission channels from LPFs to financial system

Responding authorities were asked to provide their views on several statements present in the questionnaire. Again, the range of possible responses varied from 1 – strongly disagree to 5 – strongly agree.

Among various potential transmission channels of distress from the large pension funds to the financial system, pension supervisors assessed that counterparty risk, investment concentration, and stop-loss/fire sale channels are more plausible (average score points of 3.6, 3.6, and 3.4, respectively). Supervisors in general perceived systemic distress via the security lending or repo channel and leverage channel as less likely to take place (average score points of 2.9 and 2.7, respectively; see Table 3).

Table 3. Supervisors' views of shock transmission channels from LPFs to financial system

One possible transmission channel of distress of LPFs to the financial system is ...	Strongly Disagree (=1)	Disagree (=2)	Neither Agree nor Disagree (=3)	Agree (=4)	Strongly Agree (=5)	Average
	Number of responding jurisdictions					
- counterparty risk channel	2	1	7	18	3	3.6
- investment concentration	1	3	8	14	5	3.6
- stop-loss/fire sale channel	2	2	11	14	2	3.4
- foreign exchange risk channel	1	5	13	12	0	3.2
- forced liquidation channel	3	5	10	12	1	3.1
- security lending or repo channel	5	4	11	11	0	2.9
- leverage channel	7	5	10	9	0	2.7

Note: Average is the average of score points to the statement weighed by the number of jurisdictions that gave the scoring. (Score points: 1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree).

Source: IOPS.

¹⁷ FSB 29 August 2013, Strengthening Oversight and Regulation of Shadow Banking, http://www.financialstabilityboard.org/wp-content/uploads/r_130829c.pdf?page_moved=1, site accessed in May 2017.

II.4. Long-term perspective: Macro-dimensional impact of LPFs to the economy and society

Potential macroeconomic and social impact of LPFs

Impact on investment, consumption, and production: Distress affecting large defined benefit (DB) pension funds may lay a substantial contribution burden on the sponsoring companies, resulting in reduced investment and production of the sponsor due to insufficient resources. This effect could have a long-lasting scar on the economy if the magnitude of impact is large enough. Distress of large defined contribution (DC) pension funds may reduce the retirement income of many pension beneficiaries, lowering the purchasing power of the retired and/or near-retiring generation. The trend of increasing life expectancy also has a similar impact because the accumulated pension assets need to last over a longer time span. This results in lower retirement income. Decreased aggregate demand in the economy would induce less investment and less production, slowing the economy down.

Poverty of the elderly: Distressed LPFs could put a lot of pension participants into poverty after their retirement. This, in turn, could lead to many social problems including a higher suicide rate, a higher rate of crime, and accelerated family dissolution.

Conflict of interests between generations: Distress of LPFs could put more burdens on the social security system affecting the taxpayers, mostly the younger generation.

Losing confidence in the social system: Mutual trust is an important element of social infrastructure. This may be damaged if many people find, due to the distress of LPFs, their retirement income to be much less than they expected.

Political instability: The impact described above, if large and prolonged enough, could eventually lead to political instability.

Supervisors' views on potential macroeconomic and social impact of LPFs

The responding jurisdictions expressed their relatively strong agreement with the statement that a distress of the large pension funds may have an adverse influence on people's confidence in the social system and the situation of retirees (average score points of 4.3 and 4.2, respectively). On the other hand, the influence of the LPFs' distress on the conflict of interest among generations, economic production, and political stability were perceived to be less plausible (average score points of 3.4, 3.3, and 3.3, respectively; see Table 4).

Table 4. Supervisors' views of the long-term and social impact of distress in LPFs

A distress of LPFs may have an adverse influence on ...	Strongly Disagree (=1)	Disagree (=2)	Neither Agree nor Disagree (=3)	Agree (=4)	Strongly Agree (=5)	Average
	Number of responding jurisdictions					
- people’s confidence in the social (welfare) system	0	1	4	11	16	4.3
- situation of retirees	1	1	3	12	15	4.2
- conflict of interests between generations	2	3	13	9	5	3.4

- economic production (GDP)	0	9	9	10	4	3.3
- political stability	0	6	13	12	1	3.3

Note: Average is the average of score points to the statement weighed by the number of jurisdictions that gave the score points.
(Score points: 1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree).

Source: IOPS.

III. Micro-dimensions of supervision of LPFs

As discussed earlier, the large pension funds account for a great share of total assets and members in retirement provision in certain jurisdictions. This may call for special needs of micro-supervisory attention to LPFs as well.

III.1. Micro-dimensional supervisory practice on LPFs

Many jurisdictions (Australia, Austria, Hong Kong, Canada, China, Hong Kong (China), Hungary, Iceland, Ireland, Jamaica, Mexico, Serbia, and Switzerland) have risk-based supervision or similar approach that addresses the size or potential impact of failure of large pension funds by allocating to them more supervisory resources. Even though no jurisdiction reported having any special micro-supervisory rules or guidelines dedicated for LPFs, the examples below indicate that authorities do apply special micro-dimensional supervisory practices with regard to the large pension funds:-

- *Australia*: Equal legislative and prudential framework is applied to all APRA-regulated pension funds, LPFs will have a greater degree of sophistication and maturity in various micro-supervisory areas (see Box 4. for details).
- *Canada*: Several of the CAPSA members utilise a regulatory risk-based framework that applies a consistent supervisory approach for all plans. Size is one of the factors that may influence the emphasis placed on the scope of an on-site examination for an LPF.
- *Hong Kong, China*: More supervisory resources are allocated to the LPFs than to smaller funds to the extent that supervisory risk assessments take into account the size and number of members in a scheme.
- *Hungary*: Quarterly risk assessments on LPFs are done in the areas of governance risk, internal control, risk management, investment, consumer protection, outsourcing, and collusion.
- *Iceland*: With the risk-based supervision, more resources are allocated to LPFs.
- *Ireland*: Larger schemes involve a longer on-site inspection.
- *Jamaica*: Under the supervisory framework, each pension fund is assigned an impact category. The category is based on asset size as well as the number of members in the respective pension fund. Resource allocation and intervention activities are based on the risk identified and the impact category. Larger plans are assigned a high impact and are given priority.
- *Mexico*: More micro-supervisory attention is paid to LPFs in the areas of governance, internal control, risk management, investment, stress test and contingency plan, market concentration and competition.
- *Serbia*: The size of pension fund is relevant as one of the criteria for making the yearly plan for on-site inspections. For that purpose, all pension companies are classified on the basis of net asset value they manage. If a company manages more than one fund, the criterion is the sum of all net asset values of all funds managed.

Since no jurisdiction reported specific supervisory rules or guidelines only applicable to the LPFs, one cannot expect that many jurisdictions would have a formal definition of large pension funds for their supervisory purposes. However, this does not preclude the existence of a working definition of large

pension funds. Indeed, seven jurisdictions (Australia, Brazil, Hungary, Iceland, Italy, Jamaica, Serbia, Trinidad and Tobago, and the United Kingdom) answered that they have a definition of the LPF for the risk-based supervision or an informal definition of the LPFs:-

- *Australia*: Based on its asset size, a pension fund is assigned with an impact rating which is a descriptive assessment of the potential adverse consequences that could ensue from the failure of a regulated entity (see Box 3 for details).
- *Brazil*: There is no formal definition of large pension funds, but the Instruction PREVIC nº 20/2015 that classifies the entities in profiles, for supervising purposes, uses size as a segmentation criterion. However, the criteria for size are confidential.
- *Hungary*: A pension fund is classified as a Strong Impact Institution if its membership exceeds 200,000 or its assets are above HUF 100 billion (approximately USD 400 million).
- *Iceland*: According to the FME's risk-based approach, regulated entities under supervision are classified into categories based on assets. Pension funds are considered large if their assets exceed 10% of total assets held by all pension funds.
- *Italy*: Pension funds with 4,000 or more members are subject to closer attention by the supervisor for certain aspects (e.g. prior approval of by-laws).
- *Jamaica*: An informal definition is used as the pension funds are grouped based on impact. The high impact category consists of pension funds with assets of at least JMD 300 million (about USD 2.6 million) and/or at least 100 members.
- *Serbia*: There is an informal classification of funds which is based on the size of fund's net assets relative to sector's net assets. According to that criteria, funds are classified as large (20% and above), medium (5-20%) and small (below 5%).
- *Trinidad and Tobago*: As an informal definition, a pension fund with assets exceeding TTD 1 billion (about USD 150 million) is considered large.
- *United Kingdom*: Applies a risk-based and proportionate approach to regulation, allocating resources based on an assessment of priority risk. For the purposes of the scheme return (data gathering) exercise, DC schemes are classified by the Pensions Regulator into 'small' and 'large' based on the number of members. This determines the frequency with which schemes are required to provide scheme-specific information via the scheme return to the regulator. The DB/Hybrid schemes are issued with an annual return regardless of size of membership.

Box 3. Micro-supervision practice on Large Pension Funds in Australia

All entities supervised by APRA are subject to APRA's risk assessment tool – the Probability and Impact Rating System (PAIRS). Within PAIRS, APRA applies an impact rating which is a descriptive assessment of the potential adverse consequences that could ensue from the failure of a regulated entity.

The descriptive impact scale consists of four ratings of size:-

- Extreme – in excess of AUD 50 billion in assets
- High – in excess of AUD 5 billion in assets
- Medium – in excess of AUD 500 million in assets
- Low – below AUD 500 million in assets

PAIRS generates a supervisory attention index (SAI). The SAI is designed to:-

- assist in the assessment of the size of APRA's supervisory task;
- identify individual entity and sector priorities; and
- assist APRA's planning for, acquisition of and allocation of supervisory resources.

The PAIRS rating, in conjunction with the Supervisory Oversight and Response System (SOARS), is used to determine how supervisory concerns based on PAIRS risk assessments should be acted upon. It is intended to ensure that supervisory interventions are targeted and timely.

The above impact ratings are also used to mandate the minimum level of supervisory oversight and activity by APRA (in the absence of other risk-based activities). By way of example, an extreme-rated pension fund must have a Prudential Review (on-site examination) once every 12 months – compared to once every 36 months for a low impact fund.

Source: Australian Prudential Regulation Authority (APRA).

III.2. Various aspects of micro-dimensions of supervision of LPFs

In many cases, large funds, as institutions with more resources, play a leading role in the pension sector by diffusing innovative solutions and operational patterns amongst the peers. Pension supervisors can conduct their supervision more effectively and extensively by understanding how the LPFs operate. There are various micro-dimensions of the LPFs that supervisors could focus on.

Internal control and governance: In general, the LPFs run larger and more divisional organisations, where effective internal control and governance are essential. The roles and responsibilities of each division and person should be well defined. The hierarchy of delegation from the top management to lowest level should be clearly defined and implemented. Regular and irregular internal audits should take place.

Investment: With large capacity to loss (in absolute size), LPFs are also more likely than smaller pension funds to engage in non-traditional complex transactions. However, this should be accompanied with prudent investment practice and experienced staffs with expertise suitable to the complexity of investment transactions the LPFs are engaging in.

Actuarial reviews and calculations: The actuarial calculations directly influence the amount of pension payments¹⁸. A well-functioning actuarial system is required, as well as experienced staff with

¹⁸ For more on the role of actuaries in pension supervision see: Ellis et al. (2015).

expertise regarding the complexity of pension products, especially if LPFs bear biometrical risks (e.g. longevity risks).

Risk management and solvency: Considering that the LPFs may make a stronger adverse impact on the market in times of distress and are also more likely than smaller pension funds to engage in non-traditional complex transactions, more sophisticated and well-functioning risk management systems may be required. The categories of material risks should be defined completely, and measurement and management of each risk category should be clearly documented and effectively embedded in daily operations. Where relevant, solvency of the LPFs should be thoroughly analysed and monitored incorporating all the material risks on a regular basis.

Stress test and contingency plan: Due to the size of investment and the number of stakeholders, distress in LPFs could cause disruption in the market. Stress testing is an effective means of assessing the likelihood and size of any potential adverse impact. Preparing and regularly updating the contingency plan is greatly helpful for containing the impact and orderly crisis management in the case of an adverse event.

Consumer protection: Large pension funds due to their sheer size may also tend to have a large number of current and future pension beneficiaries.

Disclosure: The LPFs have various related parties that demand meaningful and timely information. The parties include pension beneficiaries, sponsors, supervisors, other capital market participants, government agency, academia, and the general public. Transparency always contributes to reducing market uncertainty.

Collusion: Because the LPFs have a large volume of assets under their control, they might become targets of soliciting, and even bribery, from outside asset managers and others (see Box 4). The interest of pension beneficiaries and pension sponsors should not be sacrificed by pension fund managers' personal greed. The LPFs should set clear internal guidelines and processes on selecting, assessing and compensating external investment managers.

Exercising voting rights: The LPFs invest in corporate shares and have to exercise voting rights in the best interests of the fund participants. Without explicit guidelines (such as, for example, OECD Principles of Corporate Governance¹⁹), large funds could possibly exercise voting rights contrary to the interests of participants.

Supervisory resource allocation: In the perspective of supervisors, it is important allocate a proper amount of supervisory resources to LPFs in line with their risks and potential impact on the market and their own members. Efficient and effective supervision on LPFs can be achieved via well designed and properly functioning risk-based supervision framework on pension funds.

There are also other aspects of micro-dimensional supervision of LPFs which could stem from the size and complex nature of LPFs including (but not restricted to) market concentration and competition, and outsourcing.

¹⁹ <http://www.oecd.org/daf/ca/Corporate-Governance-Principles-ENG.pdf>, site accessed in May 2017.

Box 4. An example of collusion in large pension funds: CalPERS bribery scandal in the U.S.

Fred Buenrostro Jr, the former chief executive of the biggest US pension fund, California Public Employees' Retirement System from 2002 to 2008, admitted in 2014 that he took bribes and helped an associate collect millions in a fraudulent investment scheme.

Buenrostro's guilty plea arose from a year-long investigation into the role of money management firm middlemen, called placement agents, in helping clients win investment business from a California pension system that controls USD 300 billion. CalPERS said the investigation had prompted it to take "aggressive steps to implement policies and reforms that strengthen accountability and ensure full transparency."

Buenrostro started taking bribes in 2005 to use his influence with CalPERS to make investment decisions to help the clients of Alfred Villalobos. He also gave Villalobos, a CalPERS board member in the mid-90s, access to confidential investment information.

The former executive forged letters allowing firms connected with Villalobos to collect USD 14 million in commissions on USD 3 billion pension fund investments. He started writing bogus investor disclosure letters after CalPERS legal and investment officials declined to authorize them. Further, Buenrostro, after he left CalPERS and went to work for Villalobos, accepted USD 50,000 to lie to federal investigators in 2010 about their relationship.

Source: Excerpts from Paul Elias (with minor modifications), The Associated Press, 11th July 2014. (www.macleans.ca/economy/money-economy/former-head-of-u-s-pension-fund-pleads-guilty-to-bribery-fraud/, site accessed in May 2017.)

III.3. Supervisors' views on micro-dimensional aspects of LPF supervision

Among various micro-dimensional aspects of LPF supervision, the responding jurisdictions in general answered that more emphasis should be put on these funds in the areas of supervisory resource allocation, investment, risk management, governance, internal control, and stress-test and contingency planning (average score points range from 3.6 to 4.2). Responding supervisors expressed a more or less neutral position on other micro-dimensional supervisory areas, such as market concentration and competition, disclosure, solvency, consumer protection, actuarial calculation and review, collusion with outside service providers, outsourcing and exercising voting rights (average score points range from 3.1 to 3.5; see Table 5).

Table 5. Supervisors' views on the micro-dimensional aspects of LPF supervision

Supervisory areas where more emphasis should be put for LPFs than for smaller pension funds	Strongly Disagree (=1)	Disagree (=2)	Neither Agree nor Disagree (=3)	Agree (=4)	Strongly Agree (=5)	Average
	Number of responding jurisdictions					
- supervisory resource allocation	0	3	5	7	16	4.2
- investment	0	4	6	7	14	4.0
- risk management	0	4	3	12	12	4.0
- governance	0	3	6	11	11	4.0
- internal control	0	5	5	11	10	3.8
- stress-test and contingency plan	0	4	9	10	8	3.7
- market concentration and competition	0	3	14	8	6	3.5
- disclosure	0	6	12	6	7	3.5
- solvency	2	5	9	7	8	3.5
- consumer protection	1	9	10	3	8	3.3
- actuarial calculation and review	2	3	14	7	5	3.3
- collusion with outside service providers	1	7	11	6	6	3.3
- outsourcing	1	6	15	4	5	3.2
- exercising voting right	1	6	15	6	2	3.1

Note: Average is the average of score points to the statement weighed by the number of jurisdiction that gave their scoring. (Score points: 1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree).

Source: IOPS.

IV. Landscape of large pension funds

IV.1. How many large pension funds are there?

There is no single agreed-upon definition of *Large Pension Funds*. The first criterion one may think of is the amount of total accumulated assets. Although total assets represent the 'size' of the pension fund, the next thing to come to mind is whether 'size' is the universal index for the purpose of defining LPFs. If there were several different perspectives of LPFs supervision, then there would be a few different indexes defining LPFs that serve each supervisory purpose best.

For the data analysis of this paper, some working definitions of large pension funds were discussed and adopted by the IOPS members (see Box 5). These definitions include one criterion for *globally large pension funds* and three criteria for *domestically large pension funds*. For the purpose of this paper, a fund is large if it meets at least one of the criteria. There could be regionally large pension funds in some jurisdictions. However, such funds are not covered in the analysis in order to preserve the scope of the project and to ease the data-collecting and processing burden.

Box 5. Definition of Large Pension Funds (LPFs) for the purpose of data survey collection

A. Globally Large Pension Fund:

A pension fund is considered to be globally large if its assets are above USD 10 billion²⁰.

B. Domestically Large Pension Fund:

A pension fund is considered to be domestically large if

B1. its assets exceed 10% of local pension market; **or**

B2. its assets exceed 1% of local stock market capitalization; **or**

B3. its domestic government debt securities (such as T-bonds) holdings exceed 1% of total domestic outstanding debt securities.

Source: IOPS.

Having applied the above definition, the reporting jurisdictions and the United States identified 291 LPFs out of the total of 1,430,664 pension funds (See Panel A of Table 1). The number of LPFs accounts only for 0.02% of the total number of pension funds in the responding jurisdictions. 148 LPFs were identified as globally large pension funds (including 79 from the United States), and 182 LPFs were classified as domestically large funds (with 42 categorised as both globally and domestically LPFs and 7 unspecified). Globally LPFs are present in the U.S. and in 10 out of 34 IOPS responding jurisdictions. The biggest number of globally large pension funds was reported in the United States (79 funds, excluding the state funds and public funds), Australia (26), Switzerland (16) and Canada (9). Among 182 domestically large funds, 139 met the definition B2 (stock market holdings), 69 the definition B1 (local pension market share), and 41 the definition B3 (government bond holdings) (See Figure 4).

The proportion of LPFs in the reporting IOPS member jurisdictions varies dramatically depending on the jurisdiction (Panel A of Table 6). Chile reported that all six of its pension funds are LPFs (100%), and Mexico identified ten LPFs (4 globally large) out of its 11 pension funds (90.9%). At the other extreme, Australia reported 26 LPFs (all globally large) among 559 547 pension funds (0.005%), Ireland reported seven LPFs amongst its 115 632 pension funds (0.004%) and South Africa reported none²¹.

²⁰ First 300 largest pension funds in Pensions & Investments/ Willis Towers Watson 300 analysis, Year-end 2015 exceed USD 12 billion (page 46, <https://www.willistowerswatson.com/en/insights/2016/09/The-worlds-300-largest-pension-funds-year-ended-2015>, site accessed in May 2017.). First 43 (out of 64) largest pension funds surveyed in OECD 2015 Large Pension Funds survey were about USD 10 billion or larger (page 8).

²¹ The OECD survey on large pension funds 2015 lists the Government Employees Pension Fund (GEPF) with assets of USD 131.7 billion (being the largest pension fund in Africa). However, this fund is not supervised by the responding IOPS member.

Table 6. Large pension funds (LPFs) in selected jurisdictions

Panel A. LPFs in the reporting IOPS member jurisdictions (2014)

Jurisdiction	Number of pension funds				
	LPFs (a)	Global LPFs (> USD 10 bn) (b)	Pension sector (c)	Share of LPFs (d=a/c)	Share of Global LPFs (e=b/c)
Armenia	2	-	7	28.6%	-
Australia ⁽¹⁾	26	26	559,547	0.005%	0.005%
Austria	3	-	14	21.4%	-
Brazil	3	3	303	0.99%	0.99%
Bulgaria	12	-	28	42.9%	-
Canada	13	9	17,500	0.07%	0.05%
Chile	6	4	6	100.0%	66.7%
Colombia	3	2	4	75.0%	50.0%
Hong Kong, China	2	2	38	5.3%	5.3%
Hungary	8	-	44	18.2%	-
Iceland	23	-	26	88.5%	-
Ireland	7	-	155,632	0.004%	-
Israel	4	2	18	22.2%	11.1%
Italy	1	1	469	0.2%	0.2%
Jamaica	24	-	802	3.0%	-
Kenya ⁽²⁾	1	-	1,250	0.1%	-
Lithuania	4	-	33	12.1%	-
Macedonia	2	-	4	50.0%	-
Mauritius	4	-	61	6.6%	-
Mexico	10	4	11	90.9%	36.4%
Namibia ⁽²⁾	1	-	99	1.0%	-
Portugal	2	-	224	0.9%	-
Romania	5	-	18	27.8%	-
Russia	2	-	110	1.8%	-
Serbia	4	-	7	57.1%	-
Slovak Republic	3	-	35	8.6%	-
South Africa	0	-	5,141	0.0%	-
Spain	1	-	1,494	0.1%	-
Switzerland	16	16	2,000	0.8%	0.8%
Tanzania ⁽²⁾	4	-	11	36.36%	-
Trinidad and Tobago	11	-	186	5.9%	-
Turkey	4	-	250	1.6%	-
Uganda ⁽²⁾	1	-	58	1.7%	-
U.S. ⁽³⁾	79	79	685,203	0.01%	0.01%
Total	291	148	1,430,633	0.02%	0.01%
Median	4	-	60	5.6%	-
Average (simple average by jurisdictions)	8.6	4.4	42,077.4	20.9%	5.04%

Note: (1) Among 559,547 pension funds in Australia, 261 pension funds are APRA (Australian Prudential Regulation Authority) regulated with more than four members, 556,998 pension funds are ATO (Australian Taxation Office) regulated SMSFs (self-managed super funds), and 2,288 pension funds are APRA regulated with fewer than four members.

(2) National Social Security Fund (Kenya), Government Institutions Pension Fund (Namibia), National Social Security Fund (Tanzania), PPF Pensions Fund (Tanzania), Public Service Pension Fund (Tanzania), LAPF Pension Fund (Tanzania), National

Social Security Fund (Uganda). Assets of these funds are invested in financial markets and the funds are supervised by relevant pension authorities that belong to the IOPS.

(3) The non-IOPS member which provided statistical data for the purpose of this survey.

Source: IOPS and U.S. Department of Labor.

Panel B. Summary statistics of selected LPFs in non-reporting IOPS jurisdictions and non-IOPS jurisdictions that meet criterion A (size over USD 10 bn)

Jurisdiction		Number of LPFs that meet the criterion A (> USD 10 bn) ⁽¹⁾	LPFs' total assets (in bn USD) in the sample of 300 largest pension funds			
			Smallest	Median	Biggest	Average
Selected non-reporting IOPS jurisdictions	France	1	-	-	-	21.5
	Germany	9	13.5	18.8	71.3	24.4
	Netherlands	12	15.6	35.6	384.3	79.0
	Peru	1	-	-	-	15.0
	UK	27	12.5	25.0	72.2	29.8
Selected non-IOPS jurisdictions	Denmark	8	15.7	23.8	106.6	37.7
	Finland	4	22.6	41.7	44.9	37.7
	Japan	14	13.5	26.6	176.2	44.0
	U.S. ⁽²⁾	79	10.0	15.0	59.5	19.3

Note: (1) Sovereign pension funds, which are established and/or sponsored by national authorities, are not included. (2) The U.S. data were provided by the U.S. Department of Labor. Public and state pension funds are not reported here.

Source: Own calculations based on The World's 300 Largest Pension Funds– year end 2015 (Willis Towers Watson, 2016) and the U.S. data provided by the U.S. Department of Labor.

One can distinguish three generic groups of large pension funds reported in the IOPS survey. The first group are defined contribution pension funds in the jurisdictions that introduced nation-wide, usually mandatory, funded pillars. Due to high legal requirements and economies of scale needed for servicing the huge number of clients, the number of pension providers is quite limited and the size of such funds tends to be large, at least as a percentage of the total national pension market. Such situations can be observed in jurisdictions like Armenia, Chile, Mexico or the Slovak Republic.

The second group of large pension funds is observed in jurisdictions that have a social security, government pension fund or provident fund which dominates the pension landscape. Sometimes such funds are supervised by IOPS members (as in Kenya, Namibia, Tanzania²² or Uganda) but more often than not they are outside of the mandate of IOPS supervisors and therefore not included in the table (such as China's National Social Security Fund, South Korea's National Pension Service Fund, India's Employee Provident Fund, Norway's Government Pension Fund, South Africa's Government Employees Pension Fund²³).

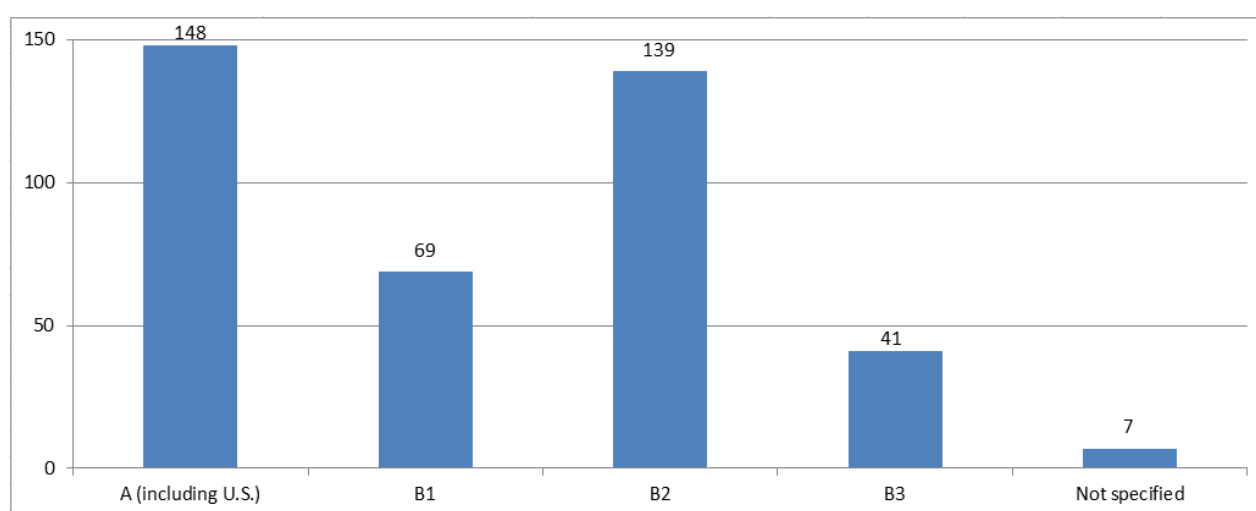
Finally, the third group of large pension funds is noted in those jurisdictions where there are some very large pension funds but also thousands of small ones (e.g., Australia, Ireland or USA).

²² In Tanzania, assets of all public funds are invested in financial markets in line with the Social Security Investment Guidelines and the funds are supervised by a regulator (Social Security Regulatory Authority) being a member of IOPS.

²³ More detailed information about this kind of funds can be found in the OECD's 'Annual Survey of Large Pension Funds and Public Pension Reserve Funds (2015)'.

There are many other large pension funds outside the reporting jurisdictions surveyed in this paper. Some of them are constantly analysed in the annual OECD surveys on large pension funds (e.g. OECD, 2016a). Panel B of Table 6 presents selected LPFs in non-reporting IOPS jurisdictions and non-IOPS jurisdictions that meet criterion A (i.e. assets exceeding USD 10 bn). The biggest number of globally large pension funds in IOPS non-reporting jurisdictions can be observed in the UK where 27 funds range between USD 12 and 72 bn, whereas the biggest globally LPFs are in the Netherlands with 12 funds ranging between USD 15 and 385 bn. Global large pension funds are also conspicuous in four non-IOPS jurisdictions: Denmark, Finland, Japan and the U.S. It is worth mentioning large public or state pension funds in the U.S., not reported in the table, such as the Federal Retirement Thrift Fund, the California Public Employees Fund, or the California State Teachers Fund have assets exceeding USD 440 bn, 285 bn, and 180 bn, respectively.

Figure 4. Number of LPFs by definitions in reporting IOPS jurisdictions and U.S.



- **A** (including U.S.): assets are above USD 10 billion (globally large).

- **B1**: assets exceed 10% of local pension market (domestically large).

- **B2**: assets exceed 1% of local stock market capitalization (domestically large).

- **B3**: domestic government debt securities holding exceeds 1% of total domestic outstanding debt securities (domestically large).

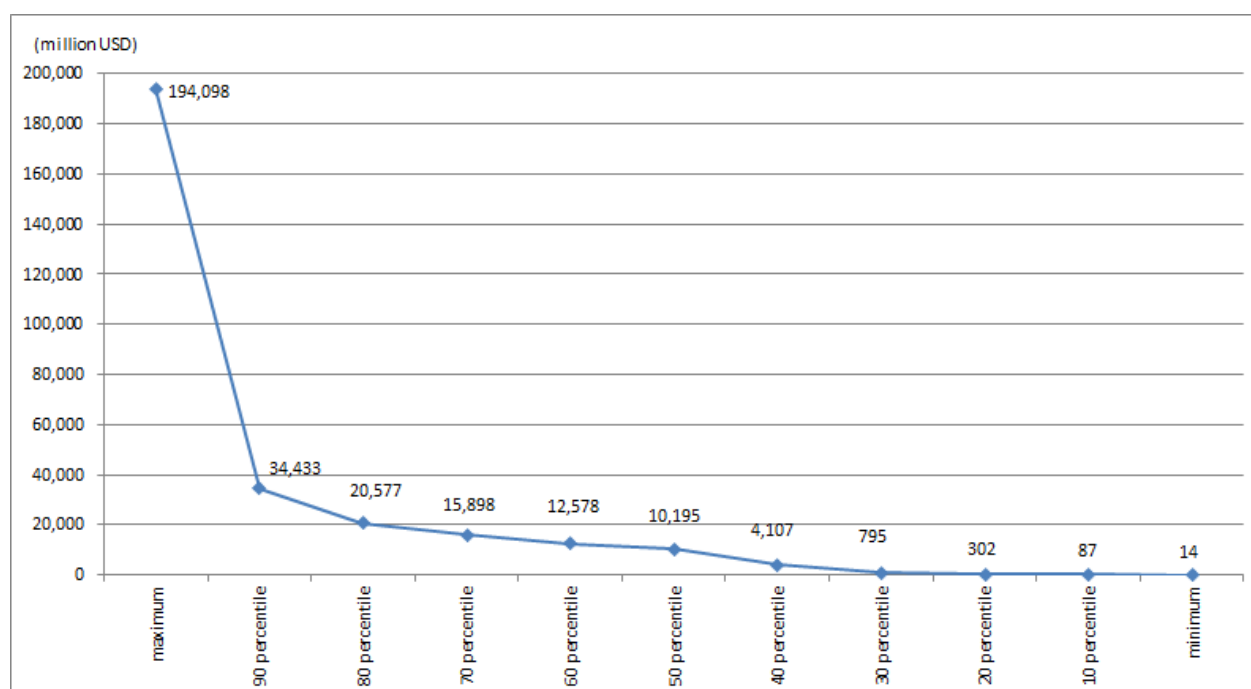
Source: IOPS, and OECD annual survey of large pension funds (2016a).

IV.2. How large are the large pension funds?

The asset size of each large pension fund differs widely. This stems from the variety of economic size of responding IOPS jurisdictions, the length of history of the pension saving sector, the size of the pension sector, and the size of capital markets.

In the reporting jurisdictions, the largest LPF has assets of USD 194.1 billion while the smallest controls only USD 14 million (Figure 5). 63 large pension funds each has total assets exceeding USD 20 billion, and the next 129 funds each manages total assets more than USD 1 billion. The smallest 91 LPFs are below USD 1 billion each. Although the latter are not large in absolute size, they still represent relatively large shares of their pension sector and/or the capital markets of the reporting jurisdictions.

Figure 5. Total assets size of LPFs in the reporting IOPS jurisdictions
by size ranking percentile (2014)



Note: jurisdictions with missing data were not included.

Source: IOPS.

IV.3. Significance of LPFs

Although the number of large pension funds is small within the whole universe of funds, their total assets and number of members take a significant share of the pension sector, indicating the importance these funds may have (Table 7). The total assets of the LPFs in the reporting jurisdictions, USD 3 844 billion, accounts for 27.5% of total pension fund assets of USD 14 001 billion²⁴.

In sum, over 119 million members belong to LPFs in the researched sample, which is 46.7% of the total 256 million members in all pension funds²⁵. The LPF with the largest number of members has 1.8 million members, while 28 LPFs were reported to have more than one million members, and the next 104 LPFs more than 100 000 members. Obviously, there are also some relatively large funds which have fewer than 40,000 participants.

²⁴ Numbers based on the data from 32 jurisdictions where total assets of LPFs and the pension sector were reported.

²⁵ Numbers based on the data from 26 jurisdictions where total number of members of LPFs and the pension sector were reported.

Table 7. Significance of LPFs in selected IOPS jurisdictions (2014)

Jurisdiction	Total assets (in million USD)			Number of members (in thousand)		
	LPFs (a)	Pension sector (b)	Share of LPFs (c=a/b)	LPFs (d)	Pension sector (e)	Share of LPFs (f=d/e)
Armenia	28	29	94.5%	-	-	-
Australia	888,971	1,967,033	45.2%	18,009	29,978	60.1%
Austria	18,513	24,119	76.8%	506	858	58.9%
Brazil	108,761	252,383	43.1%	-	-	-
Bulgaria	4,622	5,089	90.8%	3,830	4,291	89.3%
Canada	507,288	1,520,000	33.4%	1,752	6,257	28.0%
Chile	165,432	165,432	100.0%	9,746	9,746	100.0%
Hong Kong, China	25,865	79,505	32.5%	-	-	-
Hungary	3,311	4,237	78.1%	944	1,170	80.7%
Iceland	22,896	22,985	99.6%	242	242	99.9%
Ireland	27,549	232,921	11.8%	-	-	-
Israel	44,405	48,319	91.9%	1,777	2,091	85.0%
Jamaica	1,859	2,988	62.2%	40	95	42.5%
Kenya	1,400	7,880	17.8%	1,500	4,000	37.5%
Lithuania	1,265	2,330	54.3%	583	1,197	48.7%
Macedonia	653	663	98.5%	373	394	94.8%
Mauritius	415	751	55.2%	-	-	-
Mexico	144,286	146,539	98.5%	52,866	54,353	97.3%
Namibia	7,862	11,106	70.8%	130	365	35.6%
Portugal	6,657	21,254	31.3%	20	310	6.4%
Romania	5,197	6,023	86.3%	5,514	6,293	87.6%
Russia	10,240	15,999	64.0%	1,443	6,367	22.7%
Serbia	231	238	97.1%	238	253	94.3%
Slovak Republic	5,131	9,645	53.2%	-	-	-
Spain	6,791	123,474	5.5%	38	9,942	0.4%
South Africa	0	152,222	0.0%	0	14,117	0.0%
Switzerland	276,298	816,769	33.8%	1,222	4,873	25.1%
Tanzania	3,659	3,813	96.0%	1,306	1,382	94.5%
Trinidad and Tobago	5,030	7,783	64.6%	47	94	49.4%
Turkey	26,170	37,600	69.6%	2,263	5,063	44.7%
Uganda	2,000	2,200	90.9%	1,500	1,960	76.5%
U.S.	1,520,763	8,310,000	18.3%	13,418	89,900	14.9%
Total	3,843,547	14,001,329	27.5%	119,307	255,590	46.7%
Median	6,724	18,627	64.3%	1,264	3,046	54.2%
Average (simple average by jurisdictions)	120,110.9	437,541.5	61.4%	4,588.7	9,830.4	56.7%

Note: Jurisdictions with missing data were not included in the calculation of the median and the average.

Source: IOPS.

IV.4. Asset allocation of LPFs

At the end of 2014, the pension sectors in the reporting IOPS jurisdictions²⁶ invested 47.5% of their total assets in bills and bonds (including Treasury and corporates), 28.9% in shares, 5.4% in cash and deposits, 5.0% in non-traditional and alternative investments, and 13.2% in others (Table 8). Their foreign investments accounted for 8.0% of total assets and the notional amount of derivatives was 7.6% of the total assets.

At the same time, the identified LPFs in the reporting IOPS jurisdictions invested 48.4% of their total assets in bills and bonds (including Treasury and corporates), 33.2% in shares, 4.6% in cash and deposits, 4.7% in non-traditional and alternative investments, and 9.1% in others (Table 8). Their foreign investments accounted for 15.3% of total assets and the notional amount of derivatives was 16.0% of the total assets.

Table 8. Investments of LPFs and pension funds in the reporting IOPS jurisdictions (2014)

	Asset Allocation (% of total assets)						Foreign investments (% of total assets)	Notional value of derivatives (% of total assets)
	Cash and deposits	Bills and bonds	Shares	Non-traditional and alternative investments	Others	Total		
Total pension sector	5.4%	47.5%	28.9%	5.0%	13.2%	100%	8.0%	7.6%
LPFs (a)	4.6%	48.4%	33.2%	4.7%	9.1%	100%	15.3%	16.0%
Non-LPFs (b)	6.1%	46.7%	25.1%	5.4%	16.8%	100%	1.5%	0.1%
Difference between LPFs and non-LPFs (c=a-b)	-1.4%	1.7%	8.0%	-0.7%	-7.7%	-	13.8%	15.9%

Note: Australia, Austria, Canada, China, Colombia, Ireland, Italy, Mauritius, South Africa, Tanzania, Turkey. The United Kingdom and the USA are not included in this analysis as the complete data set was not available.

Asset sizes were used as weights to summarize the assets allocation by jurisdictions. Data records with missing value were not included.

Source: IOPS.

Compared to non-LPFs, it seems that the LPFs engaged much more actively in foreign investment and derivatives transactions. While non-LPFs' foreign investment was 1.5% and the notional value of derivatives 0.1% of their total assets, those of LPFs were 15.3% and 16.0% respectively. This might be due to the fact that the LPFs' size allows them to have more resources to assess and execute complex transactions, which might contribute to better diversification and return enhancement. On the other hand, larger exposure to foreign investment and derivatives contracts could possibly become a source of potential

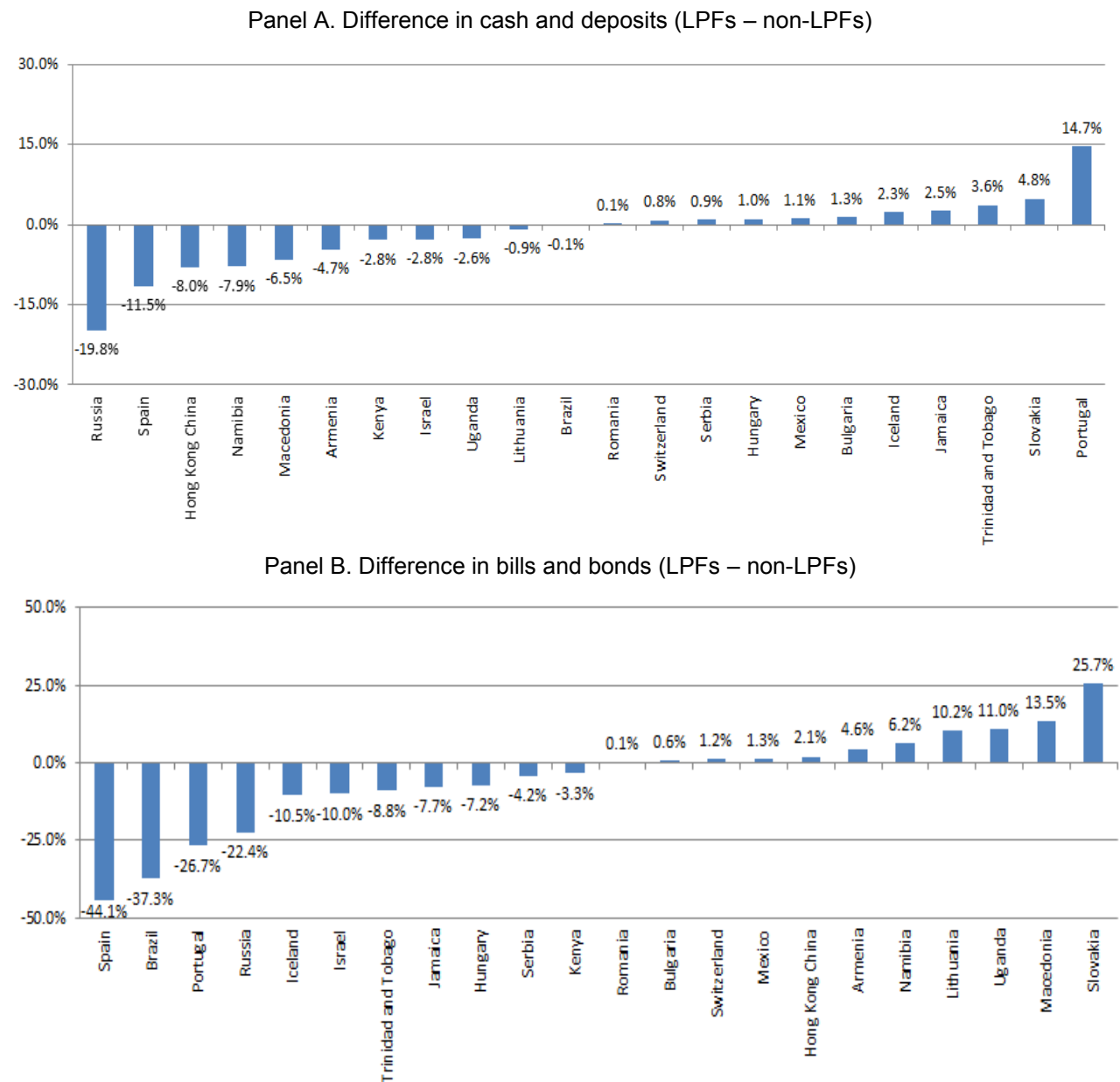
²⁶ Australia, Austria, Canada, China, Colombia, Ireland, Italy, Mauritius, South Africa, Tanzania, Turkey. The United Kingdom and the USA are not included in this analysis as the complete data set was not available.

losses in adverse financial and/or economic circumstances. LPFs also tend to invest more in bills, bonds and shares and hold less cash and deposits than non-LPFs.

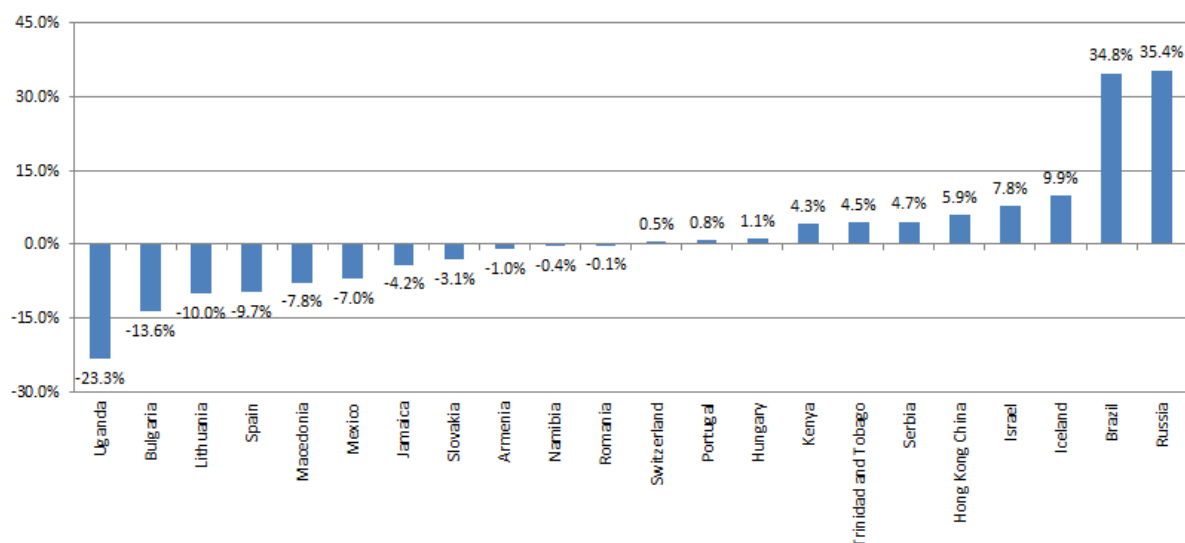
As a word of caution it must be noted that the data presented in Table 8 are highly dependent on the definition of an LPF, the number of responding jurisdictions and the method of calculating the average. Therefore, no qualitative judgments (e.g. about the risk profile of LPFs' asset allocation) should be made.

Figure 6 shows the percentage points difference in the asset allocations of LPFs and non-LPFs by selected asset classes: equities, non-traditional and alternatives, and foreign investment.

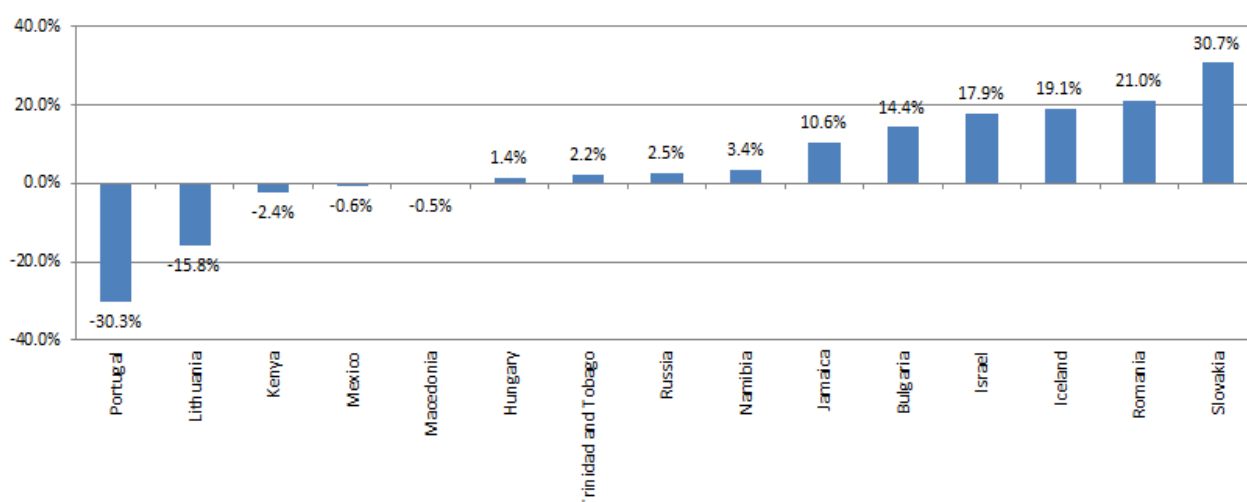
Figure 6. Asset allocation difference between LPFs and non-LPFs in selected jurisdictions (2014) (as percentage points of assets)



Panel C. Difference in shares (LPFs – non-LPFs)



Panel D. Difference in foreign investments (LPFs – non-LPFs)



Source: IOPS.

It is worth mentioning that the LPF criteria used here may not fit all individual jurisdictions' circumstances. Distinct from the defining features in Box 5, some supervisors have their own explicit or implicit criteria. For example, 10 out of 11 pension funds in Mexico are classified as LPFs under the criteria of Box 5, although CONSAR, the Mexican pension supervisor, implicitly distinguishes four pension funds with assets close to or over USD 20 billion of assets from seven pension funds with less than USD 10 billion of assets. If CONSAR's implicit criteria were applied, then the asset allocation comparison between LPFs and non-LPFs would be different.²⁷

²⁷ The difference for Mexico in Figure 6 for cash and deposits asset allocation would have been be +0.6 pp, bills and bonds - 2.5 pp, shares + 0,8 pp and foreign investment +3.1 pp. Also, Mexican LPFs invest more heavily in non-traditional and alternative investments (4.3%) compared to the other seven pension funds (3.1%).

V. Review of some of the empirical literature on the impact of pension funds on financial markets

After the recent global financial crisis, a lot of research has been devoted to understanding the role of financial institutions' in financial stability, and more specifically, the pro-cyclical and counter-cyclical behaviour of various financial institutions. Among this body of research, there has been some focus on pension funds' investment behaviour and their role in financial markets' stability. This section reviews the existing empirical evidence on the actions of pension funds. Table 9 provides a short summary.

Table 9. Existing empirical evidence on pension funds' pro/counter-cyclical investment behaviour

Authors (year)	Country	Data	Findings
COVIP (2009)	Italy	Large pension funds	counter-cyclical
Bank of England (2014)	United Kingdom	DB pension funds	counter-cyclical
Gorter and Bikker (2013)	The Netherlands	DB pension funds	counter-cyclical
De Haan and Kakes (2011)	The Netherlands	pension funds, life insurers, and non-life insurers	counter-cyclical (insurers are not counter-cyclical)
Bikker et al. (2010)	The Netherlands	pension funds	counter-cyclical
Bams et al. (2016)	The U.S., Canada, Europe, Australia, and New Zealand	978 pension funds	counter-cyclical
Jones (2016)	The U.S., Canada, Europe, Australia, and New Zealand	pension funds and other institutional investors	pro-cyclical
Duijm and Bisschops (2015)	The Netherlands	pension funds and insurers	mixed (counter-cyclical on equity, pro-cyclical on sovereign bonds)
Blake et al. (2015)	United Kingdom	DB pension funds	mixed (counter-cyclical mechanical rebalancing, pro-cyclical herding behaviour)
OECD (2010)	Selected OECD countries	pension funds	mixed (counter-cyclical in Italy, Norway, Poland, and Turkey, pro-cyclical in Spain, the U.S., Finland, and Portugal)

Source: Own analysis.

V.1. Supporting evidence of pension funds' counter-cyclical investment behaviour

COVIP (2009) shows that the Italian pension funds played a stabilising role during the crisis by buying risky assets at a bad time. In 2008, the share of their equity investment was reduced from 26% to 20.8%. This was a significant reduction but lower than the one that would be determined only as a result of the fall in equity prices. If the pension fund managers had performed no rebalancing, the equity exposure at the end of 2008 would have fallen to 14%. This rebalancing behaviour was related to the fact that Italian

pension funds are given an external benchmark from which they try not to deviate. In fact, in 2008 the pension funds were net buyers of shares. Purchases of equity securities, net of sales, amounted to approximately EUR 1.3 billion, compared with a net cash flow estimated at EUR 3.3 billion. The amount of net purchases of shares was the highest in the last two quarters of 2008 in which, at the intensification of the crisis, managers had found themselves in strong need of having to rebalance their portfolio to avoid a significant deviation from the constant composition of the external benchmark.

The Bank of England (2014) argues that British defined benefit pension funds (both corporate and local authority) appear to behave counter-cyclically in the short term (i.e. monthly, quarterly) including during the financial crisis. Pension funds tended to increase their purchases of particular asset classes in periods when their prices were falling, and to sell in periods when prices were rising. This appears to be a function of essentially mechanical portfolio rebalancing in order to meet the long-run strategic asset allocation targets. In the medium term, the study observed a decrease in equity holdings of British occupational DB funds, but this could be interpreted as a long-term structural shift away from equity holding, rather than pro-cyclical behaviour.

Gorter and Bikker (2013) compared investment risk-taking by Dutch defined benefit pension funds, life insurers and non-life insurers that collectively manage more than EUR 1 trillion of assets. They found that pension funds tend to rebalance about 40% of market price movements. Therefore, should equities double in value, Dutch long-term investors' equity holdings would increase only by 60%. Such behaviour is consistent with a contrarian investment strategy that stabilises the market.

De Haan and Kakes (2011) investigated how different institutional investors reallocate their portfolio in response to excess returns²⁸ on asset classes such as equity and bonds. The authors used quarterly data from 1999 to 2006 for portfolios of Dutch pension funds and life and non-life insurers. Looking at a momentum trading measure, De Haan and Kakes found that only pension funds are systematic contrarian investors. For all types of institutional investors, the evidence for contrarian behaviour was more pronounced for sells than for buys, suggesting that pension funds and insurers tend to be reluctant to realise losses.

Bikker et al. (2010) studied the extent of rebalancing of portfolios of Dutch pension funds using quarterly data from 1999 to 2006. The authors found that pension funds rebalance, on average, around 39% of excess equity returns each quarter. They also found that equity reallocation is higher after the underperformance of equity investment than after outperformance. In particular, only 13% of positive excess equity returns are rebalanced, while 49% of negative shocks results are rebalanced. This means that pension funds invest more when the risky assets are not performing well to profit from low asset prices. This observation can be interpreted as supporting evidence that pension funds contribute to market stabilisation when the market situation is not good.

Bams et al. (2016) analysed data from 978 pension funds of the U.S., Canada, Europe, Australia, and New Zealand from 1990 to 2011 and showed that pension funds rebalance strongly when the stock market is doing poorly, but rebalance weakly when the stock market is doing well.

V.2. Opposing evidence of the pension funds' counter-cyclical investment behaviour

Jones (2016) analysed U.S. pension funds and other institutional investors including global central banks and U.S. life insurers. Based on the observation that there is a positive association between asset allocation weight in equity and equity returns relative to other asset classes, this researcher argues that portfolio changes typically appear pro-cyclical.

²⁸ i.e. returns above the risk-free rate.

V.3. Mixed evidence of pension funds' counter-cyclical investment behaviour

Duijm and Steins Bisschops (2015) studied the investment behaviour of Dutch pension funds and insurance companies, finding that pension funds acted counter-cyclically and insurers pro-cyclically during the financial crisis of 2008. Pension funds were net buyers of equity (EUR 1.2 billion) and insurers net sellers (EUR 6.7 billion). On the other hand, the paper also found that pension funds and insurance companies sold affected sovereign bonds prior to a rating downgrade, which could result in destabilising effects at a macro-level.

Blake et al. (2014) used data on UK defined benefit pension funds from the past 25 years to find that pension funds engaged in herding behaviour when moving in and out of different asset classes and that pension funds mechanically rebalanced their portfolios in the short term in response to valuation changes. The authors also claim that the UK DB pension funds systemically switched from equities to bonds as their liabilities mature.

The OECD (2010) study shows that pension funds in some countries behaved counter-cyclically while pension funds in other countries behaved pro-cyclically. In particular, pension funds in Italy, Norway, Poland, and Turkey were net purchasers of equities when the markets suffered from the crisis during 2008 and 2009. Conversely, pension funds in Spain, the U.S., Finland, and Portugal were net sellers of equities in 2008.

VI. Is it necessary to develop special supervisory or regulatory guidelines for the systemically important pension funds?

Following the recent global financial crisis, the Financial Stability Board (FSB) and international financial supervisory bodies, such as BCBS, IAIS, and IOSCO, have been trying to set internationally agreed rules to identify global systemically important financial institutions (G-SIFI). Identification methods for G-SIFI are agreed and implemented in the banking and insurance sector for special supervisory measures. The identification methods for finance companies, market intermediaries (securities broker-dealer), and investment funds are in the process of development by the FSB and IOSCO. Considering the collective size of pension funds in the global financial market, it is natural to ask if it is necessary to develop special supervisory rules for those pension funds which may be systemically important. As already mentioned, the answer to this question should be based not only on the size of the pension funds, but on their potential contribution to global or local financial instability.

IOPS member supervisors were asked to provide their views on the issue. Some divergent opinions were revealed. With regard to the question whether global systemically important pension funds should be identified based on international standards and special regulatory or supervisory guidelines should applied, 13 jurisdictions agreed, seven disagreed and 10 had no definite views. When asked about the need to identify domestic systemically important pension funds based on domestic standards and the application of special regulatory or supervisory guidelines for them, 15 jurisdictions responded favourably, 10 were against, and five had no definitive views (see Table 10). It is worth noting that not all of the jurisdictions who responded positively provided concrete supporting reasons for their answers.

Table 10. Supervisors' views on the need to identify and apply to systemically important pension funds special regulatory or supervisory guidelines

	Agree	Disagree	No definitive view	Total
Global systemically important pension funds should be identified based on international standards and special regulatory or supervisory guidelines should be applied to them.	15	9	10	34
Domestic systemically important pension funds should be identified based on domestic standards and special regulatory or supervisory guidelines should be applied to them.	17	12	5	34

Source: IOPS members.

Here are three selected supporting comments for identifying both global and domestic systemically important pension funds and applying special regulatory or supervisory guidelines:-

- *Bulgaria:* The role of systemically important pension funds in the financial system is significant because of their complexity and systemic impact in the economy, which makes them a special supervisory subject.
- *China:* Global systemically important pension funds should be identified mainly based on the size of overseas investment because of the different conditions and regulatory principles of different countries. Regarding domestic systemically important pension funds, unified regulatory standards and reasonable regulatory requirements should be developed based on the actual situation in China.
- *Jamaica:* Global systemically important pension funds should be identified based on international standards, and special regulatory or supervisory guidelines should be applied in an effort to avoid conflicts in relation to regulatory requirements which may vary based on jurisdiction. This would promote standard reporting, thereby enhancing the effectiveness of monitoring and supervision from a global standpoint, and providing a holistic overview of the impact of large pension funds on financial markets. In addition, we believe that the relevant Memoranda of Understanding would need to be in place where cross-border supervision will occur, especially where information-sharing will be required. And systemically important pension funds should be identified based on domestic standards as well because the size of a pension fund that may pose a systemic risk will vary from jurisdiction to jurisdiction. Special regulatory or supervisory guidelines should be applied to them to reduce any contagion risks to the financial markets that could result from the collapse of a systemically important pension fund.

Here are six selected opposing comments for identifying global and/or domestic systemically important pension funds and applying special regulatory or supervisory guidelines:-

- *Chile:* A risk-based supervision approach applied to regulated entities allows the Chilean supervisor to take into account the nature, scale, complexity and relevance of different risks associated to pension funds. Hence, no specific regulation needs to be defined or applied to LPFs. Regulators or supervisors should take into account potential incentives for market participants,

for example, to artificially decrease the size of the funds to avoid having to comply with regulations. In addition, setting fixed thresholds to determine whether a fund is large could leave out these funds that are on the margin from the specific regulation. The development of the pension market in each country and how important these funds are in the final pension of members should also be considered.

- *Hong Kong, China:* There is little evidence of real systemic impact by the LPFs, and the same supervisory approaches and standards should apply to large and small funds. Supervision of the LPFs is different only in that there would be higher public expectation around the bigger funds. This in turn would make it more controversial to take aggressive supervisory or enforcement steps against the LPFs.
- *Portugal:* With regard to the domestic systemically important pension funds, additional guidelines are not necessary because if a regulatory/supervisory approach that appropriately takes into account the nature, scale and complexity of risks of pension funds is already in place, then it would not be necessary or even appropriate to issue additional guidelines.
- *Romania:* Large pension funds could be identified and supervisory focus could be applied. However, there should be the same regulatory and guidelines for all pension funds (regardless of size) but keeping the proportionality principle in mind.
- *Slovakia:* There is no need to develop special supervisory or regulatory procedures because sound supervisory procedures can be applied for every pension fund accordingly.
- *Switzerland:* Pension funds in Switzerland usually do not pose a risk to the financial system. In the case of the failure of a particular large fund, social and political risks are therefore more critical than any systemic financial risks. Large pension funds should not be treated differently from small pension funds in the broader sense of equal treatment for all beneficiaries, but the proportionality principle for allocating resources should be respected in the sense that large pension funds need more resources than small pension funds.

Six jurisdictions (Israel, Italy, Kenya, Trinidad and Tobago, Uganda, and the UK) expressed a supporting view only on identifying domestic systemically important pension funds and applying special regulatory or supervisory guidelines, while giving an opposing view on identifying global systemically important pension funds for special guidelines. Selected comments are as follows:-

- *Italy:* In order to develop special guidelines for globally large LPFs, a convincing case should be made that some large pension funds actually have had, or may reasonably have, a destabilising effect on the financial system. Regarding domestically large pension funds, it depends on national circumstances. If investments are concentrated in the domestic market and LPFs are large with regard to the domestic capital market, identification and application of special rules to domestically large pension funds would be necessary.
- *Kenya:* An internationally unified approach is not suitable because pension systems regulations vary from one country to another. Since, in large pension schemes, issues of governance, management and administration play an important role, special regulatory or supervisory guidelines should be prepared for these schemes domestically.
- *Trinidad and Tobago:* Although a large pension fund may be globally systemically important, the jurisdiction(s) in which it resides will be best suited, based on the norms, culture, and legislation of the jurisdiction, to regulate the fund. Regulators (or supervisors) would be aware that the

failure of a systemically important pension plan would have impact on its jurisdiction financially, socially or possibly even politically. Therefore, the regulator (or supervisors) should identify these pension funds and apply special stringent regulatory or supervisory guideline to facilitate early or pre-emptive action if a risk event, which can lead to loss or even the plan's failure, is likely to occur. Therefore, domestic systemically important pension funds should be required to strictly adhere to best practice and guidelines to ensure that they do not negatively impact financial stability and public confidence.

- *Uganda*: Pension funds with importance cannot be identified by fixed international standards because their make, governance, type and supervisory approach differ according to jurisdiction and laws applied. The use of domestic standards and supervisory guidelines give a more realistic view of determining domestic systemically important pension funds as this varies from jurisdiction to jurisdiction.
- *The UK*: Pension systems and the design of pension funds vary considerably between countries. Given this variation, we do not believe it would be possible to develop meaningful international standards. We agree that systemically important pension funds should be identified domestically. However, it is not the case that special regulatory or supervisory guidelines are necessary. It depends on the effectiveness of existing frameworks.

To summarize, it seems that the supervisors' views on whether or not to identify systemically important pension funds are diverse and far from consensus yet. Some of the responding supervisors emphasize the diversity of pension fund regulations, supervision and other country-specific circumstances that rather prevent setting up any meaningful unified international supervisory or regulatory guidelines. Another important line of argument is that pension funds do not pose systemic risk or that some more convincing evidence that this is the case should be collected before contemplating the introduction of international standards and/or international guidelines for identification of global large pension funds. It seems that there is some more agreement with regard to the need for identification and monitoring of large pension funds that may be important domestically; however, the supervisory approach should be based on the same principles applied to all pension funds.

VII. Conclusions

With the steady increase in life expectancy and more awareness of the role of private pensions in social security systems, it is natural to expect that the pension sector will grow and some more large pension funds (LPFs) will emerge, which in turn, might have more impact than before on financial markets and the overall economy. In the reporting jurisdictions, in many cases the large pension funds are almost as sizeable as big banks and insurance companies and have large volumes of pension members and assets.

There are two dimensions to the supervision of LPFs. The macro-dimension focuses on the potential adverse impact of such funds on financial markets and the overall economy, whereas the micro-dimension is about the possibility that inappropriate governance and operations of LPFs may bring harm to the well-being of many pension beneficiaries and pension sponsors, norms of pension funds' market conduct, and even to the orderly operation of supervisory bodies. In some IOPS jurisdictions, central banks and ministries of finance participate in macro-dimension supervision in addition to pension supervisors. However, in the majority of the reporting IOPS jurisdictions, pension supervisors deal with both the macro- and micro-dimensions of pension fund supervision. If the potential macro impact of LPFs is considered to be broad and significant, then pension supervisors' cooperation with other organisations would be advisable for implementing prompt and efficient measures.

Despite the substantial size of LPFs in the financial markets, the survey of supervisory opinions confirms that responding pension supervisors generally agree that large pension funds contribute to financial and economic stability. With regard to the pension market as a whole, the general view among policy makers, academia, and supervisors is that pension funds contribute to financial and/or economic stability due to their asset allocation practice and stability of cash flows, reasonably uncorrelated with the situation in financial markets. Empirical evidence on the impact of the pension industry as a whole surveyed in this report also seems to indicate the counter-cyclical investment behaviour of pension funds rather than pro-cyclical behaviour. However, the existing quantitative research is fragmented in terms of data coverage and methodology.

In the short-term perspective, there might be several potential channels through which shocks from distress in large pension funds may be transmitted to the financial system. Among the potential transmission channels, the responding pension supervisors assessed that counterparty risk, investment concentration, and stop loss/fire sale channels are more likely than the security lending, repo or leverage channels. In the long-term perspective, the responding jurisdictions agreed that distress in large pension funds may have an adverse influence on people's confidence in the social system and the situation of retirees. On the other hand, they deemed the influence of large pension funds' distress on the conflict of interest among generations, political stability, and economic production as less plausible.

LPFs might also require supervisory importance in the micro-dimension as they generally have more financial and operational resources (such as staff and IT systems) than smaller funds. Therefore, they are more likely to be involved in more sophisticated investment activities. Large funds play a leading role in pension fund management and operational practice. Among various micro-dimensional aspects of the supervision of these funds, the responding jurisdictions in general put more emphasis on such aspects as risk management, investment, governance, internal control, stress test and contingency plan, market concentration and competition, and supervisory resource allocation.

Some large pension funds, such as public-sector pension funds, are not supervised by IOPS members even though their investment activity and potential impact on financial markets might be similar to the LPFs discussed in the paper. This may pose a question whether such funds should not be a subject of IOPS members' supervision.

Is it necessary to explicitly identify systemically important pension funds based on international/domestic standards and apply special regulatory or supervisory guidelines for them? Although some divergent opinions were revealed, supervisors tended to believe that before answering this policy question, some more evidence on the influence of pension funds on financial markets is needed. Large pension funds may mean different things in different contexts and this is one of the reasons given by IOPS respondents as to why it would be hard to come up with global standards along the lines of other types of financial organization. Some responding jurisdictions also emphasised the need for the supervisory approach to be based on the same principle for all entities. There seems also to be some support for identification and monitoring of domestically important funds. Bearing in mind that pension funds (systems as a whole and large pension funds in particular) can have a macro impact, this topic deserves further investigation.

To effectively supervise large pension funds with potentially sizable economic and social impact, it is advisable for supervisors to regularly or occasionally analyse the macro and micro soundness of such funds. Setting clear definitions (formal or informal) of large pension funds can be helpful in identifying the subjects of the analysis. It is essential to note that even though a particular fund may not be systemically important as defined by the FSB, such a fund can still have a significant impact on the local financial markets. Supervisors can utilise the already existing risk-based supervision approach in identifying and analysing pension funds with a large impact. Supervisors may consider requiring that the LPFs show high

standards in their internal operational areas such as risk management, investment, governance, internal control, stress test and/or contingency plan. Also, a co-operation with other bodies such as the central bank and/or the Ministry of Finance can be an option in terms of monitoring the potential impact of LPFs on financial and economic stability.

This paper focused on the potential impact of large pension funds on financial markets and the economy in the macro-perspective and the impact on the pension sector and members in the micro-perspective mainly by using size as the classification criterion for the LPFs. It is important to remember that the size is only one of the potential measures that need to be taken into account while identifying systemically important pension funds. This may call for another study that would investigate other identification categories such as interconnectedness, substitutability, complexity, and cross-jurisdictional activities to assess the systemic impact of large pension funds in quite a distinct context. Such an exercise, possibly a joint study with the FSB and other key organisations in the field, could be undertaken in the future.

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