Large Canadian Public Pension Funds: A Financial System Perspective

Guillaume Bédard-Pagé, Annick Demers, Eric Tuer and Miville Tremblay

- The eight largest Canadian public pension funds (the Big Eight) are major investors globally as well as domestically, with net assets under management of more than $1 trillion.
- Because of their size, their longer-term investment horizons, the diversity of their investment strategies and the stability of their members' contributions, these funds may be better able than other financial market participants to invest countercyclically and therefore act as a stabilizing force in the Canadian financial system.
- The overall balance-sheet leverage of the Big Eight is not high. However, the trends toward more illiquid assets, combined with the greater use of short-term leverage through repo and derivatives markets may, if not properly managed, lead to a future vulnerability that could be tested during periods of financial market stress.
- The Big Eight mitigate this vulnerability by taking a range of measures, including performing liquidity stress tests. The large public funds that are most active in Canadian repo markets are also working with the Bank of Canada and Canadian banks to become limited-liability direct clearing members of the repo central counterparty operated by the Canadian Derivatives Clearing Corporation. This will reduce counterparty credit exposures between the participating funds and the banking sector and improve the overall resilience of the repo market.

Introduction

Pension funds are important sources of retirement income for Canadians that deploy patient investment capital for the global economy. The pension fund sector holds about 15 per cent of the total assets of the Canadian financial system, or $1.5 trillion.[1] About two-thirds of pension assets are managed by the eight largest public pension funds in Canada (the Big Eight): the Canada Pension Plan Investment Board (CPPIB), Caisse de dépôt et placement du Québec (CDPQ), the Ontario Teachers' Pension Plan (OTPP), the British Columbia Investment Management Corporation (bcIMC), the Public Sector Pension Investment Board (PSPIB), the Alberta Investment Management Corporation (AIMCo), OMERS (Ontario Municipal Employees Retirement System) and the Healthcare of Ontario Pension Plan (HOOPP). With net investment assets ranging from $64 billion to $265 billion, the Big Eight are among the world's largest pension funds. All eight were included in a list of the 100 largest pension funds, with three of them ranked among the 20 largest.[2]

The Big Eight manage the funds of various defined-benefit pension plans: the Canada Pension Plan, the Régime des rentes du Québec, and the plans of public sector employees of the federal and four provincial governments. A broader measure of the assets they control is gross assets under management (AUM), which is $1.5 trillion (**Chart 1**).[3] To provide further context, gross AUM of the Big Eight as a group are similar in aggregate asset size to the four biggest insurers and roughly one-quarter of the aggregate asset size of the Big Six banks.

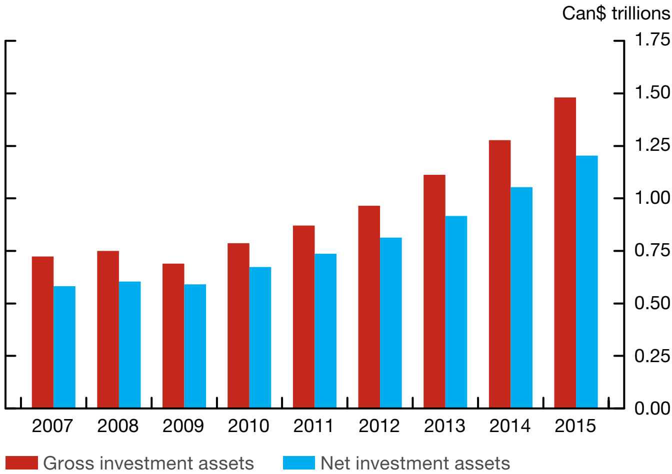
The amount of balance-sheet leverage, defined as the ratio of a fund's gross assets to net asset value, varies greatly across the funds, but appears modest at 1.3:1 for the group (**Table 1**). However, because leverage can take

1 According to Statistics Canada, $1.5 trillion is invested in trusteed employer- and government-sponsored pension funds.

2 Boston Consulting Group, "The Top 10: Investing for Canada on the World Stage," February 2016.

3 Net assets are a measure of the current resources backing the promise of the pension plan sponsor or owned by other government-sponsored funds, while gross assets are a measure of the assets controlled by the pension fund and balance-sheet leverage. For example, a $1 billion real estate acquisition that receives half of its financing from bonds issued by the fund will have $500 million in net and $1 billion in gross assets.

Chart 1: Investments managed by the Big Eight



Note: The fiscal year ends on 31 March for AIMCo, bcIMC, CPPIB and PSPIB and on 31 December for CDPQ, HOOPP, OMERS and OTPP.

Sources: Funds' latest annual reports

Last observations: 31 March and 31 December 2015

Table 1: Big Eight investment assets under management

$ billions

Fund	Gross investment assets	Net investment assets[a]
CPPIB	319	265
CDPQ	291	248
OTPP	263	168
HOOPP	147	64
OMERS	129	80
bcIMC	127	124
PSPIB	125	112
AIMCo	100	90
Total	1,501	1,151

a. Net investment assets include non-pension investment assets.

Note: The fiscal year ends on 31 March for AIMCo, bcIMC, CPPIB and PSPIB and on 31 December for CDPQ, HOOPP, OMERS and OTPP.

Sources: Funds' latest annual reports

Last observations: 31 March and 31 December 2015

many forms in addition to what is shown on the balance sheet, it is not possible to precisely assess aggregate leverage using public sources.

From a financial system perspective, the Big Eight are of interest not only for their size, the composition of their asset holdings and their investment strategies but also for their interconnections with other financial institutions. Because of their funding and derivative transactions, the Big Eight are connected to the major Canadian banks through their counterparty exposures.

This report describes the main characteristics of the Big Eight. It considers how these funds have the capacity to make the financial system more stable, as well as the potential vulnerabilities associated with some of their activities, particularly in times of heightened stress. It provides an overview of their risk-management practices and then concludes.[4]

Pension Fund Governance

The Big Eight manage the funds of various public sector defined-benefit pension plans.[5] Although the concepts are often used interchangeably, a pension plan refers to the pension benefits promised by an employer to the plan's members (the employees), whereas a pension fund refers to both the portfolio of assets that back up the promise and the organization that manages the portfolio. Among Canada's Big Eight, all but three of the pension funds are distinct organizations from the authorities that sponsor the pension plan.[6]

The Big Eight vary in terms of mandates and liability profiles. For example, although they all manage the assets of pension plans, some of them also manage funds for several public entities.[7] Their largest responsibility, however, is always the mandate of a pension plan. The plans are also at different stages of their respective life cycles, with the membership of some plans consisting of an older demographic.[8] Nevertheless, all funds share a similar real return target of close to 4 per cent per year over the long term.

Nearly all of these funds were created by specific federal or provincial legislation that sets their mandates and assigns oversight of the activities of the pension fund to a board of directors. In the three instances where the same organization is responsible for both the assets and the liabilities, the funds report to a pension regulator that focuses on the soundness of the plans, as measured by their funding and solvency ratios, and on the protection of the rights of their members. The boards of the other five funds are accountable to federal or provincial ministers, either directly or through government departments or agencies.

Pension laws impose on fund managers a fiduciary duty toward current and future retirees. Investment decisions must be based on the best interests of existing and future retirees. This principle is a cornerstone of the elaborate governance frameworks of the Big Eight, which entrust

4 This report does not cover the pension plans' design, solvency or adequacy to meet the needs of future Canadian retirees.

5 This is in contrast to a defined-contribution (DC) plan where the retirees receive a lump sum equal to the contributions made over time, plus the accumulated returns. In Canada, DC plans are found mostly in the private sector and are much smaller than the Big Eight.

6 The exceptions are OTPP, OMERS and HOOPP.

7 These additional funds include those of provincial insurance schemes, provincial endowments and various other provincial government pools of money.

8 A young plan has relatively large inflows and relatively small benefit outflows, while a mature plan will have small inflows and large outflows.

Box 1

Characteristics of the Canadian Model of Public Pension Investment

Relative to smaller and more traditional pension funds, the Big Eight are characterized by a greater

- use of internal management made possible by their economies of scale;[1]
- reliance on investment strategies designed to capture the liquidity premiums offered by less-liquid alternative assets;
- diversification across a broader set of asset classes, investment styles and geography;
- use of leverage and derivatives designed to improve returns and mitigate risks;
- reliance on in-house risk-management functions; and
- competitive compensation with the private sector to attract and retain talent.

1 External managers can, however, offer a welcome complement in some niche markets or as partners in co-investment schemes.

the boards and their respective investment committees with a critical responsibility for establishing and controlling the fund's risk appetite, investment policy and risk-management framework. The majority of boards consist of experienced business and finance professionals, generally appointed by governments, often upon the recommendation of the boards' governance committees or by an independent nomination committee. Strong governance is key for the success of large and complex financial institutions such as the Big Eight.

The Evolving Canadian Model of Public Pension Investment

The Big Eight stand apart from most other Canadian and many foreign pension funds because of their size, the way they operate and their investment strategies. Their asset-management approach, sometimes referred to as the "Canadian Model" of public pension investment (**Box 1**), has been adopted by large pension and sovereign wealth funds in other jurisdictions. The model has several key characteristics. Considerable economies of scale lower average costs, allowing the funds to employ complex, internally managed investment strategies. The funds are able to hire large teams of highly specialized professionals that allow them to invest directly in a wide range of assets and niche markets. The Big Eight are increasingly present globally, investing in less-liquid alternative assets, which include real estate, infrastructure and private equity. Although the Big Eight share common characteristics, their investment approaches differ, given their different philosophies, mandates and maturity profiles. As a result, they should not be considered a homogeneous group of investors that would react in the same manner to a market shock.

Like most other Canadian pension funds, the Big Eight believe that active management of their assets adds value over time, but they differ from other funds by managing them internally, substantially reducing their costs. In aggregate, the Big Eight employ around 5,500 people (twice that number if their real estate subsidiaries are included) and manage about 80 per cent of the funds' assets internally.

They incur total management costs of around 0.3 per cent, lower than the roughly 0.4 per cent incurred by a typical pension fund that relies wholly on external private fund managers. However, the cost difference would be larger if the typical pension fund were to invest as much as the Big Eight do in alternative assets that are more labour intensive and therefore costlier to manage than the traditional asset classes of equities and bonds.[9, 10]

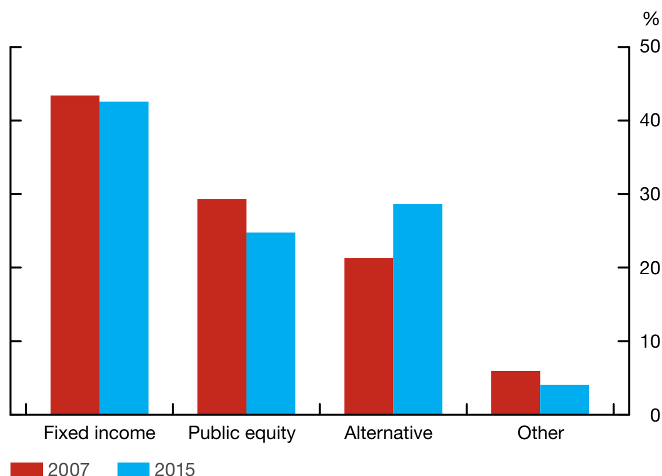
The persistence of low interest rates and the concomitant search for yield has led to a growing shift toward less-liquid alternative assets. Given the long-term nature of their liabilities and their size, the Big Eight are structurally well positioned to capture the liquidity premiums offered by such assets. On the one hand, real estate and infrastructure provide fairly predictable cash flows, offer inflation protection and, to some extent, can be seen as partial substitutes for bonds, although with a significantly different liquidity profile. Private equity, on the other hand, is generally perceived as a complement to public equities, offering potentially superior returns to large investors.

9 Pension funds invest in costlier alternative assets because they have higher expected returns than traditional asset classes. These alternative assets generally fit the long-term investment horizons of the funds and offer diversification benefits.

10 Smaller Canadian pension funds own roughly 10 per cent, on average, in alternative investments (including hedge funds), nearly twice as much as they had before the 2007–09 financial crisis, although these allocations tend to be largely in real estate. Among the pension funds worth over $1 billion (excluding the Big Eight), the larger the fund, the more important the share devoted to alternative assets tends to be. Their most frequent choice is Canadian real estate, but they show a growing interest in private equity and infrastructure.

Chart 2: Aggregate asset allocation of the Big Eight

As a percentage of gross investment assets



Notes: Alternative assets consist of private equity and real assets such as real estate and infrastructure. Other assets consist of positions mostly held in overlay strategies and external hedge funds. The fiscal year ends on 31 March for AIMCo, bcIMC, CPPIB and PSPIB and on 31 December for CDPQ, HOOPP, OMERS and OTPP.

Sources: Funds' latest annual reports and Bank of Canada calculations

Last observations: 31 March and 31 December 2015

Between 2007 and 2015, the Big Eight's collective allocation to less-liquid alternative assets—real estate, private equity and infrastructure—grew from 21 per cent to 29 per cent (**Chart 2**). This shift occurred through a gradual reduction in the allocations to public equities and fixed-income assets, suggesting that it was mostly done by channelling new contribution inflows into alternative assets, rather than by selling assets outright. Underlying the aggregate data, however, is a marked heterogeneity across the group in terms of both the importance of real asset holdings—a low of about 10 per cent to a high of about 40 per cent—and the pace of the shift since 2007.[11]

Given their size and ability to complete large transactions, the Big Eight are among the most active real asset investors in the world.[12] Many of their investments have been executed in foreign markets to increase the diversification benefits and because of the relatively limited set of attractively priced and sizable opportunities in Canada. Together with substantial holdings in international listed equities, the foreign assets of the funds have increased to a range of 35.0 per cent to 81.5 per cent in 2015, with the exception of one fund that had a negative exposure due to the net impact of its derivatives positions.[13]

In general, the Big Eight give relatively small mandates to external hedge funds since many already run some in-house, hedge-fund-like strategies. These overlay strategies use derivatives and leverage in order to seek to add value to an underlying portfolio. Derivatives are also used to hedge certain investments or liabilities or to efficiently adjust economic exposures across asset classes or geographic regions. The overall use of derivatives by the Big Eight has increased since the 2007–09 global financial crisis in terms of their aggregate notional amount and, in most cases, as a percentage of net assets. Although notional amounts of derivatives are important to consider when assessing the materiality of leverage, they do not provide a complete picture of the risk exposures of the funds, since derivatives may also be used as hedging or other risk-mitigation tools to reduce economic exposures. More information on both the size and the nature of the funds' exposures would therefore provide additional insight.[14, 15]

The three organizations that manage both the liabilities and assets of the pension plan have adopted an investment framework that minimizes the volatility of their contributions and funding status (i.e., the difference between the value of the assets and the value of the liabilities). When the benefits owed are well covered by assets, the contribution rate for members and employers can be kept stable. These liability-driven investment (LDI) strategies require the funds to hold a portfolio of assets whose interest rate sensitivities closely offset those of their liabilities. In contrast to most of their peers, these funds have higher or increasing allocation to fixed-income assets, which are partly leveraged in the repo market.[16]

11 Some of the funds already had a meaningful allocation to alternative assets before 2007.

12 When adding to their investments in real assets, the Big Eight tend to partner with other institutional investors, including each other. They usually seek local partners in foreign countries or partners that have specific industrial expertise in relation to that specific real asset.

13 Canada represents only 2 to 3 per cent of investment opportunities globally. Thus, any higher proportion invested domestically constitutes a home bias. Until 2005, pension funds were subject to a Foreign Property Rule in the *Income Tax Act* that capped investments outside Canada to 30 per cent. The original limit of 10 per cent was set in 1971 and raised over subsequent years to eventually reach 30 per cent before being removed.

14 Although the credit risk stemming from derivative activities is currently small because of netting and central clearing, those instruments are also subject to market risk. Sudden fluctuations in the prices of the underlying assets can therefore induce rapid changes in the market value of derivatives and have a non-negligible impact on financial performance and liquidity positions.

15 Derivative transactions are governed by International Swaps and Derivatives Association (ISDA) master agreements to allow transactions to settle on a net basis. As well, two-way negotiated credit support annex agreements give further counterparty protection by providing power to realize collateral posted by counterparties in the event of a default.

16 Lower interest rates increase the discounted value of liabilities. A large allocation to bonds, whose value increases with lower interest rates, is therefore a good hedge against interest rate risk. Further explanations of leveraged LDI strategies can be found in the Bank of Canada *Financial System Review* (December 2012): 36–38, available at http://www.bankofcanada.ca/wp-content/uploads/2012/12/fsr-1212.pdf.

Over the past 10 years, the Big Eight have achieved or exceeded their nominal target return of approximately 6 per cent (or 4 per cent net of inflation), with an average return of about 8 per cent. This target was achieved despite the sharp losses during the financial crisis. Over the same period, their active management has added between 30 and 210 basis points to the passive return of their policy portfolios.[17, 18]

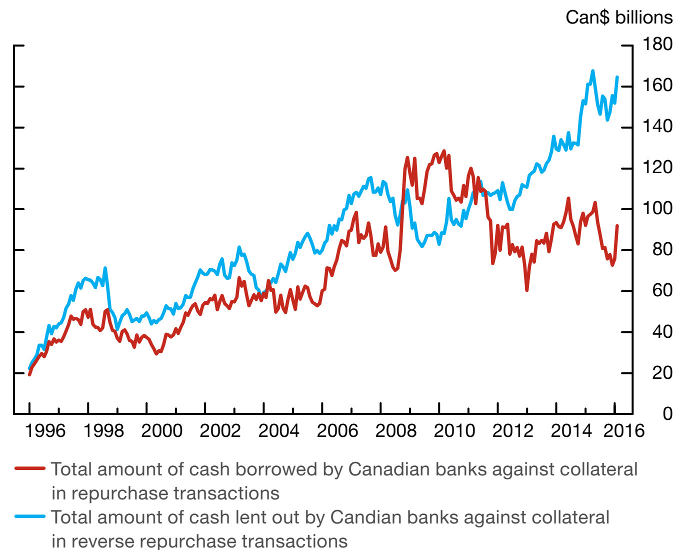
Contributions to the Financial System and Potential Vulnerabilities

Given their size and the structural features of defined-benefit plans, the Big Eight may be better able than other financial market participants to invest counter-cyclically and therefore act as a stabilizing force in the Canadian financial system.[19] Their long-term investment horizon means that the Big Eight are more likely to be able to weather short-term market volatility. The investment policies and ongoing portfolio rebalancing of pension funds can help smooth asset prices. Funds are also more likely to be able to adopt what may be viewed as a contrarian investment strategy over the short term by periodically taking advantage of opportunities in the market to purchase assets as they decline in price and reach depressed values. In addition, defined-benefit pension funds are better equipped to bear liquidity risk than defined-contribution plans, mutual funds or private fund managers, since they are not subject to redemptions by their beneficiaries that could force them to sell asset holdings in a stressed market.[20] On the contrary, they can continue to add to their asset holdings since pension plan contributions continue to be invested as they come in. There is, however, little formal empirical evidence of the actual behaviour of defined-benefit pension funds during a financial crisis.[21]

The low interest rate environment that has prevailed since the financial crisis has created challenges for pension funds. Persistently low interest rates tend to boost the prices of assets and lower their expected return while also reducing borrowing costs and increasing incentives to use leverage. In response, most of the Big Eight have increased their allocations to alternative assets,[22] and many have increased leverage, often financed short term, to support complex investment and risk-mitigation strategies. If not properly managed, these trends may lead in the future to a vulnerability that could create challenges in a severely stressed financial environment.

Chart 3: Canadian-dollar repo and reverse repo activity for all banks in Canada

Monthly data



Note: Since 2011, banks in Canada have, in aggregate, been net providers of cash (taking securities as collateral) to the financial system, which would include transactions with the Big Eight.

Sources: Banks' regulatory filings and Bank of Canada calculations

Last observation: February 2016

Leverage and derivatives also open a potential channel of contagion through which stress in the banking sector could spill over to the balance sheets of pension funds. Strategies that rely on leverage generated through repo and other similar markets therefore depend on the resilience of those markets.

An important source of leverage for some of the Big Eight has been the repo market. Unlike the situation in many other countries, Canadian banks are, in aggregate, net *providers* of funding in the repo market, rather than net demanders of liquidity (**Chart 3**). When using the repo market to add leverage to their fixed-income portfolios, the Big Eight rely on both domestic and international banks for liquidity to adjust duration and enhance returns. The funds could also use the repo

17 The policy portfolio is the long-term strategic allocation of assets whose return is measured by the relevant market indexes. The actual portfolio will differ as a result of active management decisions and, if successful, will show their added value.

18 Although skill plays a role, the differences in performance cannot be fairly compared across the Big Eight because the return and risk objectives vary for each pension plan, largely as a function of their liabilities and funding status.

19 L. Schembri, "Double Coincidence of Needs: Pension Funds and Financial Stability" (speech to the Pension Investment Association of Canada, Québec, Quebec, 15 May 2014).

20 In defined-contribution plans, participants are freer to alter their asset allocation. For example, in a panic, investors may sell risky assets and convert their holdings into cash.

21 A recent Bank of England study concludes that the evidence of potential stabilizing asset allocation in the investments of UK pension funds is mixed. See "Procyclicality and Structural Trends in Investment Allocations by Insurance Companies and Pension Funds: A Discussion Paper by the Bank of England and the Procyclicality Working Group," July 2014.

22 The investment trend toward alternative assets likely comes at the cost of reduced liquidity and increased complexity. The heated global competition for real estate, infrastructure and private equity may push the Big Eight to enter larger, more complex and possibly riskier transactions.

market as a preferred source of liquidity rather than sell assets outright. It is estimated that, at the end of 2015, the Big Eight were counterparties to about 15 to 35 per cent of the total amount of repos and reverse repos outstanding that Canadian financial institutions reported on their balance sheets.[23]

If banks themselves were to experience a period of acute funding stress due to an unexpected adverse event, they could reduce their repo lending to even their most high-quality counterparties, such as public pension funds, potentially forcing such counterparties to sell assets to repay the borrowed funds. Derivatives could trigger similar dynamics if funds faced unexpected margin calls, requiring them to raise cash by selling assets. The adverse impact on asset prices could then propagate losses to other financial institutions more broadly, with potentially important spillover effects to the rest of the financial system.[24]

This dynamic underlines the important role played by well-regulated central counterparties (CCPs) in reducing counterparty credit exposures and systemic risk in markets such as for repos and for certain derivative transactions. To increase the resilience of Canada's core fixed-income and repo markets, the Bank of Canada has been supporting an initiative since 2010 to develop central clearing in the Canadian repo market. In 2012, the Canadian Derivatives Clearing Corporation (CDCC) began to clear fixed-income cash and repo transactions between the banks most active in the Canadian repo market. The Bank is now working with CDCC, the existing bank clearing members and the four public pension funds that are most active in the repo market to develop a new clearing model to allow those pension funds to become limited-liability direct clearing members of the repo CCP. This will further increase the overall resilience of this core funding market and support pension funds' access to repo funding in stressed conditions.

Risk Management

The Big Eight face vulnerabilities, but these vulnerabilities vary significantly in terms of importance and composition. The funds assess vulnerabilities and manage them within a risk-management framework adapted to their investment policies. For many, the financial crisis led to a significant reinforcement of risk management, particularly around liquidity. They have also invested more heavily in technology and systems, reduced reliance on external credit ratings, improved stress testing and enhanced the independence of the risk-management function.[25]

The greater use of more complex investment strategies by Canadian pension funds has required improvements to their risk-management systems. The Big Eight are expanding their risk models, moving away from those that are driven mainly by the short-term, mark-to-market volatility of liquid, public assets and toward those that would better tackle long-term risk in less-liquid asset classes.

The Big Eight generally mitigate rollover and liquidity risks by holding a buffer of liquid assets.[26] For this reason, the strength of liquidity-risk-management frameworks is key to assessing this vulnerability. The funds that access external sources of funding (e.g., the repo and securities-lending markets, short-term commercial paper programs and longer-term financing in the bond market) to leverage some of their assets[27] appear to be much more aware of the higher contingent funding risks, including rollover risk, and perform rigorous liquidity stress tests. It is important that, when designing these tests, the funds consider extreme situations in which they could have diminished access to leverage from derivatives and repo markets.

Conclusion

No pension fund can achieve a 4 per cent average real return in the long run without assuming a certain amount of properly calibrated and well-diversified risk. This group of large Canadian pension managers seem generally well equipped to understand and manage that risk. The ability of the Big Eight to withstand acute stress is important for the financial system, as well as for their beneficiaries. They can rely on both the structural advantages of a long-term investment horizon and stable contributions. Moreover, they have reinforced their risk-management functions since the height of the 2007–09 global financial crisis.

23 These figures are based on outstanding repo exposures in foreign currencies and Canadian dollars, as reported on consolidated balance sheets. Market shares are estimated by aggregating both sides of the balance sheets of all market participants (i.e., reverse repos and repos) and then comparing the share of the Big Eight with the total. It's important to note that figures reported on the balance sheets of participants are imperfect proxies for the total quantity of repos outstanding, i.e., repo and reverse repo exposure can be offset (reduced) to some degree using bilateral netting agreements, or through central clearing.

24 At the international level, the Financial Stability Board is researching potential vulnerabilities of pension funds and sovereign wealth funds as part of its analysis of structural issues in asset management. See "Meeting of the Financial Stability Board in London on 25 September," FSB press release, 25 September 2015, available at http://www.fsb.org/2015/09/meeting-of-the-financial-stability-board-in-london-on-25-september.

25 Most chief risk officers (CROs) report directly to the chief executive officer to strengthen CRO independence, and regular reports are made to the board and its investment committee.

26 Some funds define their liquidity narrowly as cash and cash-like securities; others use a broader definition to include additional liquid assets such as government bonds. The percentage of assets variously defined as cash substitutes range between 13 and 82 per cent. The funds that tend to have large ongoing incoming contributions as a source of liquidity tend to hold fewer liquid assets.

27 Most of the Big Eight or their real estate subsidiaries have issued bonds that are rated AAA or AA.