On the sustainability of the Canadian model

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The Canadian model is generally regarded is one of the most successful investment models. Historical performance shows good risk adjusted returns, outperforming passive investment strategies and other investment models. This performance is attributed to four specific characteristics: its governance, large allocation to private markets, internal management and the focus on long-term value creation. The central question in this study is to what extent the Canadian model can be as successful in the future as it has been since the launch of the model over twenty years ago. The first part of the paper studies the specific characteristics to determine whether the group of institutions pursuing the Canadian model, the so-called Maple-8, are a homogenous group or a merely a diverse group using similar principles. The second part of the paper discusses the current state of the model based on interviews with the Maple-8's c-suite and subject matter experts. The overarching message is that the Canadian model should first and foremost remain focused on value creation and must seek the reassertion of its license to operate. Improvements of the model can be found in risk management and the use of technology. The model provides a good opportunity to further strengthen Canada's pension system.

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1. Introduction

The Canadian retirement system follows the World Bank model, which consists of four pillars. The World Bank model should lead to a replacement rate, being the retirement income versus working income, that is high enough to avoid a poverty fall when people retire. In Canada, the first pillar consists of the Old Age Security (OAS) program and an income dependent Guaranteed Income Supplement (GIS). The OAS is available to everyone over 67 without paying any contributions. The payout is not income related, but it is dependent on the number of years a person lived in Canada. The GIS is meant to support low-income individuals to receive a minimum retirement income. The second pillar is the Canada Pension Plan (CPP), managed by the Canadian Pension Plan Investment Board (CPPIB), and the Quebec Pension Plan (QPP), managed by La Caisse de D**é**pôt et Placement du Québec (CDPQ). This pillar is funded by contributions by employees, employers and self-employed and is largely a pay-as-you-go (PAYG) system. Although it is income related, the benefits are capped. Strictly speaking, there is no solvency target related to these funds: the so-called 'steady state' financing implies that the current level of contributions should cover all future liabilities. As part of the reforms in the late nineties, a funded reserve fund, known as the base Plan, is in place to cover several years of benefits. The additional Plan, which came into effect in 2019, is funded too and offers some enhancements to the base Plan supporting the replacement rate. Pillar 3 consists of mandatory and fully funded corporate and public pension plans. Pillar 4 consists of voluntary individual pension products via insurance companies and banks. Given the relatively low and capped amounts available via pillar 1 and 2, the replacement rate is largely dependent on pillar 3.

The Mercer CFA Institute Global Pension Index (Mercer, 2022) places a "B" rating on the Canadian retirement system and ranks it 13th out of 44 countries. The sub-components of this index show some variation. Ranked as number 11, Canada scores relatively well on sustainability, although high household debt and government debt are a concern[2]. On adequacy Canada scores lower (18) as more Canadians should have access to corporate pension plans[3] in pillar 3. In terms of integrity Canada ranks only just above the mean (20). This sub-component deals with the factors as funded status, regulations, governance, and the value to the members versus its costs. If this sub-component is not organized properly it could lead to wrong incentives in terms of taking too much risk in the pension fund, no proper risk-sharing arrangements, and taking contribution holidays or even taking money out by the sponsor when the funding ratio seems high. History has shown that these actions could clearly undermine the sustainability of pension plans.

[2] The Fraser Institute voices similar concerns. See: https://www.fraserinstitute.org

[3] Leech & McNish (2013) argue that a significant higher percentage of Canadians had access to pension plans in the past, but for many corporations the financial burden of running a defined benefit plan has become too high.

The largest eight institutions managing public pension funds in pillar 3 are called the Maple-8[4]. With over C$1 trillion in asset under management, the Maple-8 is a strong economic force and as such important to analyse. In addition, the investment approach used by the Maple-8 is known as the Canadian model. This model has led to good investment performance since its introduction in the late nineties. Pension expert Keith Ambachtsheer (2016, 2021) often points out that the genesis of the Canadian model must be linked to management expert Peter Drucker's 1976 book "The unseen revolution: how pension fund socialism came to America". Drucker envisaged the growing economic power of pension funds, sometimes called social capitalism. His main message was that pension funds should operate as single-purpose, arms-length agencies, and not be tied to any specific interest group. Moreover, pension funds should be set up as high performing organizations with a focus on direct investments in the real economy and act as assertive owners of publicly traded companies. All within a clear risk tolerance and transparent risk governance framework. Drucker's foresight almost fifty years ago is still very relevant.

The Canadian model was born when the Government of Ontario launched the Task Force on Public Sector Pension Funds with the aim to restructure the Teachers' Superannuation Fund. This pension fund had failed in multiple ways, including poor investment performance, an ambiguous governance structure and inadequate funding. The overarching objective was to deliver retirement security for plan members, considering affordability, sustainability, and intergenerational fairness. To improve the funded status even higher returns were needed than the 12% interest rate at the time of the restructuring. In line with Drucker's work, the Task Force introduced the following principles: 1) alignment of interests and collaboration between the different stakeholders without political interference, 2) having an independent and professional Board in place, 3) provide patient capital, 4) exposure to alternative assets, 5) in-house management, and 6) competitive compensation for investment professionals. Most Canadian public pension funds were restructured and/or set-up following these very same principles. Innovation was not a principle from the outset, but over time innovation has become an important element of the Canadian model too[5].

The Canadian retirement system has attracted significant attention over the years. For example, already twenty years ago Mendelson (2005) praised the mindset behind the Canadian model. He described in detail the set-up and workings of CPP and QPP and mentions that they should serve as a perfect example of how to set up the social

[4] The Maple-8 consists of the following institutions: CPPIB, CDPQ, OTPP, PSP, OMERS, BCI, AIMCo, and HOOPP. The choice to analyze the Maple-8 institutions is somewhat arbitrary, as more public pension plans exist in Canada. However, all funds falling under the Maple-8 umbrella have more than C$100bn in assets and the gap with the other public pension funds is significant. This choice does not imply that the smaller institutions such as OPTrust and IMCO are not important and/or less professional.

[5] See Betermier, Zvan & van Gelderen (2023).

security system in the US. His plea was that a hybrid system based on partial funding would provide the stability the US pay-as-you-go system could benefit from. Right after the global financial crisis, the top-10 Canadian public pension plans commissioned a study, conducted by the Boston Consulting Group (2013), into the economic impact of public pension plans. This study concluded that the public pension plans are well run organizations and a cornerstone of the Canadian economy. A few years later, the World Bank[6] (2017) praised the Canadian public pension funds for being world-class pension organizations with a focus on delivering retirement security for plan members. The report claims that the Canadian model is the blueprint for new emerging pension funds. Rozanov (2015; 2017) concludes that many large funds globally are moving closer to the characteristics of the Canadian model[7]. In addition to autonomy, internal management and investments in alternatives, he points out the entrepreneurial mindset and the level of innovation. A recent paper by Lipschitz and Walter (2020) claims that US public pension plans can learn a lot from their Canadian peers. They point out the bravery to reform the retirement system in Canada in the nineties as the foundation for its current success. Moreover, they mention the cooperation and solidarity between stakeholders, solid funding policies and clear governance as key characteristics of the Canadian model. Beath et al (2020) show that the Canadian model outperforms its international peers in terms of absolute return (7.9% versus 6.1%) and value add (0.6% versus 0.2%). Moreover, the Sharpe ratios are significantly better as well, whilst the asset portfolios show better hedging qualities. Keith Ambachtsheer's (2021) assessment is that the Canadian model has delivered 0.6% more value than its national and international peers over the period 2006-2015. The excess return is even 2.2% per year compared to a liability-matching portfolio. Betermier & Liu (2022) praise the Canadian funds for being more active in real estate than their international peers in terms of geographical diversification, direct investments and green activism. This article substantiates Rozanov's claim of internal management and cutting-edge innovation.

This paper follows the terminology used by the Bank of Canada (2016, page 34): a pension plan refers to the pension benefits promised by an employer to the plan's members (including pension administration and member communication), whereas a pension fund refers to both the portfolio of assets that back up the promise and the organization that manages the portfolio. The two combined makes up the pension scheme.

[6] In cooperation with Common Wealth, AIMCo, HOOPP, CDPQ, OPTrust, and the Government of Ontario

[7] A point to note is that Rozanov's sample does not include US public pension plan. The article states that in countries like the US and the UK, there is no trust in the government's ability to run entities effectively and, moreover, without political interference.

Table 1.1 Overview Maple-8 based on annual reports 2022

	Est.	Type	Sponsor	Crown	Pillar	AuM	Funding ratio	Discount rate
CPPIB*	1997	Federal	Federal and Provincial Governments	Y	2	C$539	-	3.7%
PSPIB**	2000	Federal	Government of Canada	Y	3	C$230	125-130%	3.9%
CDPQ***	1965	Provincial	Government of Quebec	Y	2/3	C$402	-	3.9%
AIMCo****	2008	Provincial	Government of Alberta	Y	3	C$158	124%	3.0%
BCImc*****	1999	Provincial	Government of British Columbia	Y	3	C$211	105%	3.5%
OTPP******	1990	Occupational	Government of Ontario and Ontario Teachers' Federation	N	3	C$247	106%	2.15%
HOOPP	1960	Occupational	Ontario Hospital Association and Unions	N	3	C$104	117%	3.8%
OMERS	1962	Occupational	Various government entities and four unions in Ontario	N	3	C$124	95%	3.75%

* CPPIB's real discount rate is based on the actuarial report of the Office of the Chief Actuary (December 31, 2021)

** PSPIB's real discount rate is based on the actuarial report of the Office of the Chief Actuary (March 31, 2021) regarding the Pension Plan for the Royal Canadian Mounted Police. This report is the most recent report of the four pension plans within the federal government. The funding ratio is a best estimate of the four plans combined and is based on regular dialogues between PSP and The Treasury Board (TBS).

*** CDPQ's discount rate is the rate Retraite Québec uses in its actuarial report (December, 2021) on Québec Pension Plan.

**** AIMCo' largest client, Local Authorities Pension Plan, is used as a proxy for the funding ratio and discount rate; data is taken from the annual report 2021

***** BCImc' largest client, Municipal Pension Plan, is used as a proxy for the funding ratio and discount rate. The funding ratio and the discount rate are based on the valuation in 2021. The funding rate of 105% is without a 5% contribution stabilization reserve.

****** OTPP's nominal discount rate is 4.3% and a real discount rate of 2.15% implying an inflation rate of 2.15%.

Table 2.1 shows some of the key characteristics of the Maple-8 institutions. The common denominator is that all Maple-8 institutions manage sizable public defined benefit funds in pillars 2 and 3. Moreover governments back up these institutions as a sponsor and they all follow the principles laid out by the Task Force on Public Sector Pension Funds[8]. Despite the communalities, there are fundamental differences too:

- Table 2.1 shows that there are federal, provincial and occupational plans. CPPIB and PSP are the two federal plans: CPPIB manages the pillar-2 pensions for all Canadians, except for Quebec[9], whilst PSP manages the

[8] See page 3 for the principles. See footnote 5 for the scope of the pension fund.

[9] Pillar 2 for Quebec, QPP, is managed by CDPQ.

assets related to the pillar 3 pension plans within the Canadian government. The provincial plans run the assets of government related institutions within the specific province. These assets are not restricted to pension plans but can include insurance companies and special purpose vehicles too. In contrast to the two federal plans, they are multi-client institutions. The eligible pools of assets are mentioned in their individual acts. The occupational plans are the only institutions responsible for the pension scheme (pension plan plus pension fund). In essence they serve a large constituency of eligible clients by offering a single pillar-3 pension scheme.

- Given the different nature of the institutions, the sponsor plays a different role too. Being a sponsor does not necessarily include a financial obligation. For example, the government designed the Canadian pension plan (CPP) managed by CPPIB, but the funding comes from the employers in Canada excluding Quebec. It is also not true that all pension schemes can rely on a financial backstop by the government. This is true in case of the federal pension scheme[10], but certainly not for the occupational pension schemes.
- The federal and provincial institutions are crown corporations. Crown corporations in Canada are owned by the government and serve a mix of commercial and public policy objectives. They are set up as private or independent companies. The five Maple-8 crown corporations are exempt from the part of the Financial Administration Act stating that the government needs to approve certain investments, placing them at arm's length in terms of investment decisions. Still, the crown corporations do need to table their annual report in parliament. As such, the federal and provincial pension funds are accountable to the government. This is not true for the occupational pension schemes, which are fully accountable to their sponsors and members.
- A general principle is that the investments are at arm's length from the sponsor. Put differently, the sponsor has no influence on the investment decisions made. The Boards are in place to oversee the management company but, given the differences mentioned, the Board's responsibilities vary too[11]. The boards of the occupational pension schemes are responsible for running the pension scheme. Therefore, the responsibilities of the Board include the responsibility of the plan's solvency, strategic asset allocation and specific transactions. The Boards of the federal plans are not responsible for the plan's solvency but do decide on the strategic asset mix and specific transactions. The provincial funds serve multiple mandates from different depositors, which do not all have board representation. The different clients determine their own strategic asset allocation, albeit advised by the management company. As a result, the boards' main role is limited to overseeing the investment function and sometimes the approval of individual large deals[12].

[10] The pensions are not part of a collective bargaining process with the unions.

[11] The sponsor controls the Board by means of the nomination process. See appendix II for a description per institution.

[12] The Board of BCImc does not approve any investment decisions.

On February 19, 2021, Bloomberg Market interviewed AIMCo's then new Chairman, Mark Wiseman, who claimed that the Canadian model is at the forefront of pension fund investing and that "*there is no safer place in the world to have your pension than in Canada"*. This statement coming from an industry expert certainly expresses deep faith in the model and is supported by the model's solid performance in the past. The key question is to what extent the Canadian model is future proof. In other words, does the Canadian model require modifications to remain successful? After all, the Canadian model is criticized too. More recently the complexity of the investment portfolio and the continued international expansion has triggered questions about operational complexity, scalability and cost levels. Gros and Sanders of the C.D. Howe Institute (2019) questioned the sustainability of Canadian pension plans in terms of the ability to meet the pension promise, especially in a low-yielding environment. According to this institute, increased transparency is needed to maintain trust in the model. The IMF (2019) points out that the Canadian public pension plans have become riskier over time by using more leverage whilst increasing the exposure to alternative assets. Given the sheer size of the public pension plans, systemic risk is rising. Hence, one of the IMF's recommendations is to strengthen regulatory oversight.

This paper addresses the future of the Canadian model in two steps. First, a cross-sectional analysis will provide an answer whether the Maple-8 must be seen as a homogenous group of pension fund investors or rather a diverse group using the principles of the Canadian model as they see fit. Given table 1.1 and its explanation, it's clear that the Maple-8 consists of very different institutions. The analysis in section 2 will compare the Maple-8 in terms of their investment beliefs, asset allocation, and investment performance. Specific attention will be given to what extent the principles of the Canadian model apply. The second step is an assessment of the need for change. This is based on interviews with the c-suite of the Maple-8 and subject matter experts using a set of hypotheses around disruptive themes. At the end of the paper conclusions and suggestions to move to a Canadian model 2.0 will be provided.

2.0 A cross-sectional analysis of the Maple-8's investment strategies

The following section will compare the investment strategies of the Maple-8 and to what extent the principles of the Canadian model applies. This will be around investments beliefs, asset allocation and performance. Moreover, internal versus external management will be discussed as well as the solvency.

2.1 Investment beliefs

Koedijk and Slager (2011) emphasize the need to have proper investment beliefs in place as it forces investment organizations to think carefully about their investment objectives. Investment beliefs provide guidance how to achieve these objectives, whilst it prevents investment organizations from herding into unproductive investment strategies. It requires a clear understanding of the investors' raison d'être, which links nicely into the 'Investor Identity' model developed by Monk & Rook (2023). At the core of this model is the investment company's thumbprint, which reflects its unique circumstances. The discussion in the previous section was all about this thumbprint. In addition, the model distinguishes inputs (capital, process, people, and information) and enablers (technology, culture and governance)[13].

Appendix 2 provides the overview of the Mapple-8's investment beliefs, following the 'Investor Identity' model[14]. It must be stated that the categorization of some beliefs is not unambiguous as some beliefs point to different parts of the model. Moreover, some terms are interpretable in different ways. For example, risk is often seen as a statistics variable (process) but can also imply a specific mindset (culture). Some remarkable findings must be mentioned. First, believes related to the thumbprint don't seem to be there. Although some institutions refer to their position as long-term capital provider, none mentions their specific role as public pension asset manager. The exception is OMERS, which, as an occupational pension plan manager, emphasizes its specific fiduciary duty to its members and beneficiaries. Moreover, the differences in mandates and governance between federal, provincial and occupational funds, their thumbprint, don't seem to play a major role in the investment beliefs. But, by not emphasizing the specific investment role it plays, the group places itself among any other (long-term) investor.

[13] Innovation is not a separate factor in the model, because, according to the authors, innovation is an interactive process of all factors combined.

[14] CDPQ and HOOPP do not publish their investment beliefs externally, which doesn't mean there is no internal guidance how to invest. It is unfortunate not to have public access, because both cases are unique with CDPQ having a dual mandate and HOOPP having a liability driven investment approach.

Moving to the input factors, it is surprising that none of the investment beliefs mentions size (capital) as a competitive edge and/or an entry to more lucrative investment proposals. Yet, academic evidence shows that size does matter. Using the CEM Benchmarking database, Dyck and Pomorski (2011) find that the difference in performance between small and larger pension plans is between 43 and 50 basis points per year in favour of the larger pension plans[15]. Moreover, there is no evidence in the data suggesting that the size benefits abate for the very large plans such as CPPIB. Large pension plans seem to be better positioned to build strategic relationships with more successful managers and get access lucrative deals[16]. In addition, larger pension plans are more successful in negotiating better fee-structures with external managers and can reduce costs by internalizing investment management activities. Another input factor is people, which is mentioned explicitly by only three institutions. BCImc is the only institution to mention skills as success factor. Most of the investment beliefs relate to process and information. The common ground can be found in the more traditional views on efficient markets and modern portfolio theory.

Regarding the enablers, the complete absence of investment beliefs on technology is remarkable. Perhaps most institutions are still in an experimental stage with big data and advanced analytics. The mere fact that the specific governance model helps to protect the investment institutions form interference from the sponsor is also not mentioned specifically. The investment beliefs related to culture are first and foremost referring to the acceptance of risk, but no references are made to an entrepreneurial mindset. And yet, this is an important element of the Canadian model[17]. OTPP is the only institution that mentions innovation explicitly.

Purely based on the public investment beliefs, the Canadian public funds do not differentiate themselves clearly from other type of investors. Most attention tends to be given to the traditional discussions of efficient markets, or how to generate alpha-returns. But this is not the main role of the federal funds and the occupational funds; there mandates are broader. For the provincial funds it might be difficult to come up with one set of investment beliefs covering different types of mandates. In line with Koedijk & Slager (2011) the different institutions should consider to focus more on their specific thumbprint when reviewing their investment beliefs.

[15] The larger pension plans perform significantly better in their alternative investments as private equity and real estate, but not necessarily hedge funds.

[16] The return distribution of alternative managers is much wider than the return distribution of equity managers. Therefore, selecting the successful managers in alternatives is more impactful than is the case in equities.

[17] See Betermier, van Gelderen and Zvan (2023)

2.2 Asset allocation and internal management

Over the years the strategic allocation of institutional investors has moved around significantly. When interest rates in the eighties were close to 10%, the allocation to fixed income was an obvious choice. However, since the nineties, interest rates have been on a gliding path to almost zero percent in 2020. This has been positive for the market value of existing bonds, but it also implies constantly lower re-investment returns. In the years between the dot.com crisis (2000) and the global financial crisis (2008), investments in risky assets increased significantly. Lucas & Zeldes (2009) showed that the US state and local pension plans moved on average to 60% in equities, 24% in bonds, 6% in real estate, 3% in alternative investments and 7% in cash and other investments. After the global financial crisis many defined benefit plans lowered their allocation to equities and started to increase their allocation to alternative investments (Ivashina & Lerner, 2018). According to the authors, this increase cannot be explained by the existence of superior returns on alternatives. After all, the returns pension plans generated on their alternative portfolios prior to the global financial crisis were hardly any better than the return on their traditional assets. The main benefit of the alternative investment was found in the diversification they bring. Betermier et al (2021) provides a similar picture for Canadian private pension plans. According to the authors the decline in interest rates led the lower solvency ratios since the turn of the century. To manage the solvency risk better, a move to more bonds was made. To offset the lower yields on bonds, the allocation to alternatives was increased. In addition, the authors provide two interesting observations. First, the shift in allocation resulted in a slightly lower return than a traditional 60/40 portfolio, but this was the price paid to have less solvency risk. Second, the larger pension plans were better positioned to make a switch to alternatives; the smaller plans lagged behind.

Table 2.3 provides an overview of the asset allocation of the Maple-8 in 2022. The different funds do not use the same asset categories and definitions. Therefore, the table might show some deviations from information in the annual reports, but the purpose is to compare the broad asset allocation. Two specific elements need further clarification. First, all funds use leverage, which takes the form of issuance of debt and synthetic leverage. The first type of leverage is reported on in the annual report, but the amount of synthetic leverage is not always clear and changes over time. The difference between gross and net AuM provides a proxy for debt leverage[18]. Even when the proxy for leverage provides a reasonable number, it is not obvious how leverage is allocated. From a theoretical point of view, the leverage should be used to increase the economic exposure of the strategic asset allocation. After all, this is the portfolio with the optimal trade-off between risk and return[19]. The reality is different: leverage is oftentimes allocated to specific asset classes or strategies. A clear example is the use of leverage in the LDI

[18] The data in table 2.2 is based on net AuM numbers, except for BCImc. The 9% in 'other' is mainly the leverage used by BCImc.

[19] On an unlevered basis.

approach, as the leverage is used to fund a matching fixed income portfolio. HOOPP's LDI approach explains the significant difference between gross and net AuM. It doesn't mean that HOOPP is taking excessive risks, because the difference doesn't say anything about economic leverage. It is quite the opposite: HOOPP's LDI approach leads to less solvency risk. Leverage can also be used tactically. For instance, OTPP, which used leverage in 2019 to fund a significant bond exposure. Subsequently, the data over 2020 showed a significant reduction in leverage from almost 40% to 8%, and it was back up to 28% in 2022. The most recent numbers show that the leverage among the Maple-8 ranges between approximately 8% and 28%[20].

Table 2.3 Asset Allocation 2022

	Equities	Bonds (incl cash)	Credit / Private debt	Private Equity	Real Estate	Infra	Other
CPPIB	27	7	16	32	9	9	-
PSPIB	26	20	10	15	14	10	5
CDPQ	25	9	21	20	12	13	-
AIMCo	38	32	3	6	13	8	-
BCImc	30	37	4	12	16	10	(9)
OTPP	6	34	-	23	10	13	14
HOOPP	13	58	-	11	10	3	5
OMERS	11	28	6	20	16	19	-

The second point of clarification relates to grouping. Oftentimes the annual reports show more details than table 2.3. In the case of 'Bonds', cash is included on the assumption that long-term investors will have a limited allocation to cash. The exception is OMERS, whose allocation to 'Bonds' includes a material allocation to cash. Most inflation related products are likely to fall under 'Bonds' too, but not all. OTPP is the only fund using 'Inflation' as a separate asset class, which includes commodities, natural resources and inflation hedges. However, in table 2.3 commodities and natural resources are ranked under 'Other', whilst the inflation hedge has been added to 'Bonds'. PSP's 5% allocation to natural resources is also ranked under 'Other". The category 'Credit / Private debt' could also include the investment in residential mortgages. Obviously, there is credit risk in residential mortgages, but the main risk factor is interest rate risk. The group 'Other' is more than just a closing entry: it comprises of strategic choices,

[20] CPPIB 24%, PSPIB 15%, CDPQ 11%, BCImc 9%, OTPP 28%, HOOPP 78% and OMERS 25%. No data is available for AIMCo.

amongst other to hedge funds. OTPP and HOOPP have a 10% and 5% allocation to hedge funds, which is a significant part of their allocation percentages in 'Other'.

Table 2.3 leads to several conclusions supporting the principles of the Canadian model. Given that equities and bonds are the main public market asset classes, five out of the eight funds allocate more than 60% to private markets. Even when 'Credits / Private Debt' are fully allocated to public market investments, the percentage invested in private markets stays beyond 50%. The funds having more traditional asset allocations are AIMCo, BCImc and HOOPP. Given the role of AIMCo and BCImc, this doesn't come as a surprise. Their clients aren't necessarily experts in private markets and could be reluctant to incorporate private assets in the strategic asset mix. Moreover, not all clients are pension funds and private assets might be less suited for non-pension mandates. The asset allocation of HOOPP is a function of its LDI approach and therefore shows a large allocation to 'Bonds'. With respect to private markets, the allocation to real estate is significant for all funds. This is not a conclusion typical for the Canadian model. Real estate has always been an asset class long-term investors have been interested in. The allocation to younger private asset classes differs per fund dependent on the individual thumbprint and conviction levels. For example, as CPPIB has the longest investment horizon and an absolute return mandate, it is no surprise that this fund has the highest private equity allocation. Infrastructure is increasingly considered an inflation-matching asset class. Over the last few years, most funds have increased their allocation to this asset class materially, especially when liabilities are index-linked. Most recently, the private debt market has attracted a lot of interest, but the speed of adoption differs: the funds responsible for the strategic asset allocation such as PSP are the first movers in this asset class.

Another element of the Canadian model is internal management, but it is hard to gain insights into the exact percentage. Given the size of the different funds it is likely that most of the investments in public markets are internally managed. After all, the cost benefits are substantial and dependent on the complexity of the investment strategies, an internal team can be put in place to provide market exposure (β) and some additional returns (α). The degree of internal management related to private markets is hard to determine due to the variety of investment choices. For example, private equity has three main choices: fund investments, co-investments and direct investments. Fund investments are externally managed, but oftentimes provide co-investments opportunities to increase the economic exposure to specific deals in the fund. Large investors are interested in co-investments, because co-investments come without fees and therefore reduce the costs of their private equity portfolio significantly. Yet, co-investments need to be analyzed and underwritten, which requires an internal team. Building an internal team to do direct investments is less likely as it would position the Maple-8 in direct competition with the private equity firms, which could jeopardize the access to attractive co-investment opportunities. Moreover,

end-investors are not set up to source direct investments. A similar situation exists with private debt, which can be invested in via funds, but given the growing allocation to this asset class, internalization is a real option. Most deals come to investors via sponsors such as banks and private equity firms, but it still requires a team of credit analysts to assess the credit worthiness of the investments, the capital structure of the company and the debt covenants. With regards to real assets (infrastructure, real estate and natural resources) different structures can be found. Best known are the real estate subsidiaries as Ivanhoé Cambridge owned by CDPQ, Oxford Properties by OMERS and Cadillac Fairview owned by OTPP[21]. The main benefit of these subsidiaries is their high level of specialization and autonomy. Given their expertise and focus, these subsidiaries are likely to invest more in higher risk segments (development) than the other funds available to investors. Given the specialization, compensation structures are often different than the parent company. Moreover, more agility exists regarding the approval of specific transactions, as it is the board of the subsidiary consisting of subject matter experts, approving transactions rather than the board of the investment management company. In order to keep the subsidiary's strategic direction aligned with the overall strategy, executives of the investment management company often join the subsidiary's board as well. An interesting recent development is that OTPP and CDPQ both announced to integrate their real estate subsidiaries again. Cost benefits seem to be the main driver behind these decisions, but it means that these activities are going to be managed internally. Another manifestation is the creation of so-called investment platforms[22]. In this case the funds act as a financial investor and look for operating partners to manage the assets. The benefit of the platforms is that there is more direct control over the individual investments and different operating partners can be used for distinct investment strategies. As such, it is more appropriate to consider these platforms part of internal management than the subsidiaries.

In conclusion, the percentage of internal management among the Maple-8 funds is relatively high and still growing. The announcement by OTPP[23] to allocate another C$70b to private markets to deal with a low interest rate environment and is anecdotal evidence of this. Based on its proprietary database, CEM Benchmarking suggests that the percentage of internal management by the Maple-8 falls between 60% and 80%.

2.3 Performance and solvency

As mentioned in the introduction, several studies have pointed out the superior investment performance by comparing the Maple-8 returns with a 60/40 benchmark. This is a rather rudimentary approach and doesn't do

[21] Within infrastructure, examples are CDPQ Infra and OMERS Infrastructure. CPPIB owns Antares Capital, a private loan originator.

[22] PSP has created several platforms, such as Roadis to invest in (toll) roads and AviAliance to develop airports around the world.

[23] Financial Times July 5, 2021

justice to the complexities of running a DB plan. Dixon (2008) rightfully points out that investment performance of defined benefit pension plans must be assessed with the interaction between investment results, contributions, liabilities, discount rates and risk tolerance in mind. As such, a direct comparison of the absolute returns is less meaningful as the pension plans vary significantly. Moreover, the single performance numbers reported by the Maple-8 are in many cases the averages of multiple mandates[24]. Yet, some conclusions can be drawn. For all funds, the 5-year performance numbers are lower than the 10-year performance numbers, whilst 2022 was for several funds a challenging year. This trend at least partly reflects the decline in interest rates over the last twenty years. The impact of this decline was higher in the 2012-2017 period than in 2018-2022. The significant differences in performance in 2022 are largely due to the divergence in fiscal years. For CPPIB, PSPIB and BCImc the fiscal year runs from April to March. The other funds' fiscal year is in line with the calendar year. This one quarter alone shows that short-term market volatility can have a material impact on performance numbers. Therefore, the 5-year and 10-year performance numbers provide better insight in the value long-term investors create and their unique characteristics.

Table 2.4 Historical performance

	2022		5-year		10-year	
In %	Fund	Benchmark	Fund	Benchmark	Fund	Benchmark
CPPIB	6.8	4.7	10.0	9.2	10.8	9.2
PSPIB	10.9	3.8	9.0	7.0	9.8	8.4
CDPQ*	(5.6)	(8.3)	5.8	4.9	8.0	7.0
AIMCo	(3.4)	(5.2)	5.9	5.3	7.2	6.5
BCImc**	7.4	4.6	8.3	7.3	9.1	8.0
OTPP	4.0	2.3	7.3	6.8	8.5	7.5
HOOPP	(8.6)	(13.2)	6.3	3.6	8.4	5.7
OMERS	4.2	7.2	6.1	7.1	7.5	7.4

* the performance number is the average of 48 depositors. The range of performance in 2022 was (3.9) to (8.0).

** Based on BCImc's pension clients

[24] As described in paragraph 2.1, several institutions manage a variety of different mandates.

The absolute and relative returns in table 2.4 look good but need to be placed in the right context. One approach is to compare the benchmark returns with the discount rate the institutions use. After all, if the actuarial equation holds that the sum of the contributions and the return on investments cover the liabilities, a higher return on the investments than the discount rate should lead to a funding surplus[25]. In general terms, there are two main approaches to determine the discount rate. The conservative approach is to base the discount rate on default-free interest rates. The idea behind this is that the pension plan must at all times be able to pay-out its liabilities. It's also referred to as the solvency ratio. The problem with this approach is that changes in the value of the liabilities are largely determined by their long duration[26]. The other approach is based on a the 'going concern' principle. In this case the discount rate is based on the expected return on the assets[27]. This approach uses a higher rate and will show better funding levels than in case of default-free rates. The problem is that unreasonably high expected returns will distort the true funding status. For example, McQuillan (2015) describes the massive hidden funding gaps associated with the Californian public pension plans using discount rates[28] of over around 7%. Canadian public pension plans use the going-concern method too but, as can be seen in table 1.1, for most the real discount rates remain far under 4%. It is clear in table 2.4 that the Maple-8 have generated better returns than their discount rates over the last ten years, which triggers the question why they are not more aligned. Differences between performance and discount rates occur, because the actuarial horizon used to set the discount rate is much longer than the more cyclical returns on the portfolio. The performance and discount rates are expected to be closer aligned over longer periods of time.

Table 2.4 shows that the average added value over the 10-year period was 0.96% and over the 5-year period 0.75%. An outlier is OMERS. Over a 10-year period the company showed a slightly better performance than its discount rate, but this has not been the case over the last five years. In 2022 OMERS underperformed its

[25] Other factors, such as changes in the pension plan and changing mortality rates, have an impact on the funded status too.

[26] It's hard to hedge against these changes without long interest rate swaps, which leads to a pro-cyclical investment strategy via the associated margin requirements.

[27] The discount rates in table 2.1 are going concern based. The Canadian public pension plans do not have solvency discount rates.

[28] By using high discount rates there is less urgency to increase contributions and/or adjust retirement pay-outs. According to the Public Policy Institute of California (PPIC) the combined funding gap of CalPERS and CalSTRS already amounts up to a stunning US$ 245 billion.

benchmark significantly, leading to a further drop in funding status[29]. Given the almost C$2 trillion AuM managed by the Maple-8 this is a very significant number.

In contrast to standard benchmarks, CPPIB and PSPIB work with so-called reference portfolios. A reference portfolio is an easy to implement, low cost and passive portfolio and is a representation of the available risk budget. As such, a reference portfolio does not fulfill the role of a traditional benchmark in terms of anchoring the asset mix. It implies an absolute return mandate instead of a relative return mandate based on traditional benchmarks. CPP's base Plan is only partly funded and its sustainability of this part of the retirement system is dependent on future contributions rather than the funded status. The main focus is on so-called adjustment risk, which is the probability that the minimum contribution rate exceeds the legislated rate (9.9%). As such, the reference portfolio is the trade-off between maximizing return and minimizing the adjustment risk. Since 2019 CPPIB's reference portfolio consists of 85% global public equity and 15% Canadian government bonds[30]. However, CPP's additional Plan, which leads to additional coverage (up to C$81,000) and a higher replacement rate (33%), is fully funded and its reference portfolio consists of 55% equities and 45% bonds. These numbers come closer to PSP's reference portfolio consisting of 59% equities and 41% bonds[31].

2.5 Concluding remarks on the homogeneity of the Maple-8

The question raised in the first part of this paper is to what extent the Maple-8 is a homogeneous group. Given that all institutions manage defined benefit public pension plans and have generated solid investment returns, a confirmative answer can be given. However, the thumbprints of the federal, provincial and occupational funds are very different. Even the two federal funds have very different thumbprints. And yet, despite these differences they all apply in their own way the principles as laid out by Drucker. Perhaps the most important observation related to the Canadian model is that the governance structures have helped the Maple-8 to stay free from political interference and has fully dedicated its time and efforts on long-term value creation.

[29] These numbers excluding OMERS are 1.05% and 0.95%.

[30] The reference portfolio has moved from 65% in equities and 35% in bonds in 2015. The numbers in table 2.4 are therefore somewhat misleading, because the opportunity to do better than the reference portfolio was larger before 2015 than after..

[31] The Canadian government's risk tolerance states that with 95% probability the funding status must exceed 70% over a 10-year horizon.

3.1 Is the Canadian model in need of change?

The previous two chapters set the stage for the following discussion: is the current Canadian model robust enough to deal with the future? As described in the introduction, the Canadian model is considered by many as one of the better investment models in the world. Since the pension reforms in the late nineties, the performance and resilience of this investment model stands out compared to the experience of other investment models. But after being in existence for over twenty years, it's likely that the Canadian model needs modifications. Not only are the plans much older with significant more AuM and shorter liabilities, but markets and the external environment have changed too. Although the Canadian model is first and foremost an investment model, it cannot be assessed without the specific role of the Maple-8[32]. The central question in the remainder of this paper is to determine the robustness of the current investment model and the modifications needed to remain successful. A set of ten statements was tested by means of interviews and discussions with senior executives of the Maple-8. Given that the Maple-8 executives frequently meet to discuss a variety of topics, the interviews could show group think and self-serving beliefs. To test for this, a group of subject matter experts were asked to provide their inside on the same topics too. To respect and protect the privacy and confidentiality of the interviewees, no specific views are expressed that can be related back to the interviewee or the institute. This common practice in social science was shared with the interviewees before the interviews took place to be able to facilitate open and unbiased discussions.

The following statements were developed to guide the interviews. By design, some statements are provoking and do not reflect the views of the author.

1. The Canadian pension plans no longer have the full support of all stakeholders.

The pension reforms in the nineties were badly needed: performance was disappointing, combined with ambiguous governance and unclear risk-sharing arrangements. Moreover, the unfunded status of the liabilities was a concern as growing liabilities would make the pay-as-you-go system unsustainable. Two decades later, different stakeholders might not necessarily know the history of the public pension plans. Especially the younger generation demand more individual freedom related to the level of their contributions and the investment manager to turn to. They might not even trust the current governance on which they have no influence. Politicians might feel the current system is unfair as members of public pension plans are much better off than members of other plans. The solution

[32] See also the discussion on investment beliefs and the Maple-8's specific thumbprint.

points in the direction of the Australian model[33], or even fully individual schemes such as the 401K plans in the US.

2. The success of the Canadian model is context dependent.

In 2017 the World Bank issued a document with the title "The evolution of the Canadian pension model; practical lessons for building world-class pension organizations". The report shows the origin and benefits of the Canadian model, but also makes a statement that the Canadian model could serve as a blueprint for new pension plans in emerging markets. It's a bold statement as the conditions in emerging markets are very different and governments might not be able to launch and/or support public pension plan at all. A case study by van Gelderen & Bergsma (2021) on a pension initiative in Ghana show that several success factors of the Canadian model are not in place, which is most likely true for other emerging markets too. As such the Canadian model benefitted from unique circumstances in Canada but might not be transferable to other parts of the world at all.

3. The public pension sector needs an independent supervisor.

The IMF (2019) as well as the World Bank (2017) have praised the Canadian model but have also expressed concerns around the lack of independent oversight. The Maple-8 are governed by their acts and their boards perform a supervisory role. It's a fragmented system with different government departments, federal and provincial institutions involved[34]. Moreover, the focus seems to be on the requirements mentioned in the acts, such as regulatory filings, audited financial statements, valuation reports and actuarial valuations, and member disclosure information, but not on the investments. The Office of the Superintendent of Financial Institutions (OSFI) and the Financial Services Regulatory Authority (FRSA) are becoming more active in terms of positioning papers, whilst the Bank of Canada (BoC) talks to the plans considering its financial stability policies. In sum, the oversight of the public pension plans is fragmented, segmented, and relying heavily on self-regulation. Given the size of the sector and its impact on the Canadian economy more formal oversight is expected.

4. As liabilities shorten, the Maple-8 will divest from private assets.

Since the pension reforms in the nineties, the initial liabilities have much shorter durations. The retirement of the baby boomers during the 2020-2040 period will require significant pension pay-outs. For several pension plans the

[33] The Australian model can be described as a competitive collective defined contribution system.

[34] Ministry of Finance (CPPIB), Treasury Board Secretariat (PSPIB), Retraite Quebec, British Columbia Financial Services Authority Superintendent of Pensions, Office of the Alberta Superintendent of Pensions, The Office of the Superintendent of Financial Institutions (OSFI) and the Financial Services Regulatory Authority (FSRA) of Ontario.

cash balance is already negative: more cash is paid out in pension liabilities than cash received from contributions. Moreover, the time to recover from a funding deficit is shorter than before. Both factors stress the need for more liquid assets. As such, private markets will fit less in a total fund strategy, whilst public markets and/or cash flow matching strategies become more appealing.

5. The use of a reference portfolio is most suited for value creation.

The traditional investment approach of benchmarks and risk budgets per asset class leads to investment silos and too much focus on α-returns. The essence of a pension fund mandate is to generate enough returns to, in addition to the contributions, pay for the pension liabilities. As such, a pension fund mandate is an absolute return mandate shaped by a total fund approach. To deliver on the mandate and to add value, the investment restrictions should be kept at a minimum. This is exactly what a reference portfolio does: it provides an overall risk budget reflecting the risk tolerance of the sponsor. Within that risk budget, the funds are free to optimize the returns as best as possible.

6. Over time the Maple-8 will become more asset class agnostic.

The dynamics in public and private markets change constantly. Public markets are at times less liquid than expected, whilst private markets turn out to be more liquid than perceived. More private companies postpone a public listing and stay private for longer. Moreover, the constituents of public market benchmarks change over time and not necessarily in the interest of the investment strategies of pension plans[35]. Private markets on the other hand might have better matching characteristics than public markets. For example, infrastructure deals could provide long duration, inflation-linked exposures matching defined benefit liabilities. Ultimately, it is the investment characteristics (factors) that matter more than the asset class characteristics. As a result, total fund management will move away from the traditional asset allocation.

7. The first mover advantage in private markets is gone

Private markets have moved from a rather esoteric to a mainstream asset class. Some private assets, mainly real estate, have been around for a long time, but asset classes as infrastructure, natural resources, private loans and private equity are more recent additions to modern investment portfolios. Institutional investors are interested in the following benefits: 1) the illiquidity premium versus listed assets, 2) private assets were seen as an opportunity to further diversify the portfolio, and 3) private assets showed lower volatility due to a different valuation method. These benefits are losing traction due to the institutionalization of these asset classes. Liquidity has improved due

[35] Dependent on the time horizon and the risk tolerance, a pension fund could prefer value or growth stock. An equity index drifting to one particular style could become less suitable as a benchmark.

to the surge in secondary markets. The yield difference still exists but most likely due to other factors than the liquidity factor. More private market assets have public market equivalents. As a result, part of the diversification benefits of private markets can be achieved via public markets. To arbitrage between similar assets in public and private markets the valuation methods become more aligned and the premise that private markets are less volatile than public markets is losing ground. The first mover advantage in any newly developed private asset will be short lived.

8. Climate change will force the Canadian model to adopt impact as a principle too.

Climate change and the role of long-term investors is a very topical discussion. An increasing number of investors, including the Maple-8, have committed to net-zero portfolios in 2050. At the same time, investors have pointed to their fiduciary duty of generating a required investment return to avoid investments in green assets. Clearly, there was an implicit fear that climate investments would lead to lower investment returns. Latest insights have shown that green investing provide opportunities for good returns too, whilst having an environmental impact too. Given its unique position as patient capital provider, the Maple-8 must redefine its role as impact investor.

9. The Canadian model can only survive by adopting new technologies and advanced analytics

The internal investment strategies pursued by the Maple-8 have been dominated by bottom-up fundamental investment cases. This approach certainly paid off in private assets: having significant control over the investments not only demands an in-dept knowledge of the business model, but also offers the opportunity to influence the strategic direction of the investment[36]. It's questionable whether fundamental analysis alone will be sufficient going forward. Given the surge in digitization and new data sources, the amount of new data significantly outpaces the traditional data sets used in fundamental analysis. To make efficient use of this development, investors need to adopt new technologies as artificial intelligence and advanced analytics to better the business models they invest in and to differentiate between noise and signals in market prices.

10. The Maple-8 needs strategic relationships rather than business relationships

The Maple-8 has built up large internal investment teams and expertise. Yet, especially in private markets, there is a strong reliance on external partners too[37]. He main function of these external partners is deal origination and asset management. Although these relationships are oftentimes referred to as strategic relationships, the manifestation of the term strategic is first and foremost related to the intended duration of the cooperation. In essence it is a long-

[36] In contrast to investment management, often referred to as asset management.

[37] See Monk & van Gelderen (2019)

term business relationship: the limited partner (LP) provides funding, and the general partner (GP) invests. Oftentimes the LP tries to push for additional services such as a minimum number of co-investments and/or access to research and even (proprietary) data with very little in return. Given that the Maple-8 is maturing and the growth in assets is slowing, the Maple-8 investors become less relevant to their partners. A review of the strategic relationships is needed. Moreover, nothing stands in the way for the Maple-8 to build strategic relationships among themselves benefitting from their relative strengths, promoting their license to operate and signing joint contracts with external partners.

3.3 Insights from the Maple-8 executives.

The overarching message from the Maple-8 executives is that the Canadian model and the defined benefit plans it serves, has significant value. The pooling of investments, the long-term investment horizon and professional management are mentioned as positive factors. There is a strong belief in the superiority of a defined benefit pension plan over other pension products. Not only will members be assured of a certain minimum retirement income, but ultimately it is more cost-effective for the society as well. The risk-sharing and full funding of pension liabilities will benefit society more than the individual savings in a defined contribution system. Members might feel bad about the lack of choice and flexibility, but surveys done by occupational pension plans show that the same members are very supportive of the current system. Moreover, newly introduced defined benefit schemes find good demand[38]. The Maple-8 is fully aware that not all stakeholders share the same view; pressure and advocacy groups have become more vocal over the years. But the most cited stakeholders are politicians. This makes total sense, because the government as sponsor could have a direct impact on the public pension plans in contrast to the indirect impact other stakeholders might have. The term politization of pensions is frequently used: there is a fear the government as sponsor might try to influence the investment choices in terms of protectionism and more investments in Canada. Politicians could be tempted to claim pension money to pursue other political agenda points than securing retirement income. Moreover, politicians might consider the current situation in Canada as unfair as members of public pension plans are much better off than people in the private sector. To create an even playing field, politicians could push for a defined contribution scheme. Yet, this would imply the end of a very successful pension system. A better option would be to investigate how more people could benefit from the existence of public pension plans. The general feedback from the Maple-8 is that the sector needs to emphasize its social license to operate, but that the best defence is to continue to deliver good performance. Ultimately, the Canadian model is about long-term value creation.

[38] For example OPTrust Select and CAAT's DB Plus

Despite the positive feedback on the workings and success of the Canadian model, many doubt whether the model can serve as a blueprint for emerging pension plans. The launch of the Canadian model was possible, because all stakeholders were aligned and brave enough to adopt Drucker's suggestions. It's not a given that such a far-reaching reform would be possible in the current political environment. Moreover, several interviewees doubt whether the ideas related to retirement are universal as different socio-economic developments could very well lead to different retirement and savings systems. Even if the Canadian model is seen as a blueprint, then emerging pension plans will be faced with higher fees of external management and higher costs due to the lack of scale. Both factors will lead to lower net performance, which cannot be offset by higher returns in private markets. The Maple-8 interviewees suggest that the main lesson from the Canadian model for emerging pension plans is to keep political interference out of the investment decisions[39].

The idea of more independent oversight led to different reactions. Several interviewees asked the question what an independent supervisor is supposed to add to the existing governance structure. Moreover, serious doubts exist whether an independent regulator would have the skills and knowledge to regulate the complexities of the sector. Yet, the interviewees do mention that policy mistakes and/or significance underperformance will trigger discussions by the sponsors and is a potential threat to the model. Self-regulation by the sector is not seen as a valid option and policy recommendations by OSFI and provincial regulators as FSRA are appreciated. This is also true regarding the Bank of Canada initiatives related to liquidity management and risk management. However, banking oversight should never be applied to the pension plans: banks and pension funds are two fundamentally different institutions. The Maple-8 welcomes external advice and recommendations but fears a regulator with the discretion to dictate changes impacting the Maple-8's ability to create value.

It's a given that the different funds are aging, but for many Maple-8 funds this is not seen as an immediate concern. First, the liability profile is changing very slowly. Part of the reason is that the public pension plans are still open for new members and new members create new long-term liabilities[40]. Secondly, several public sectors will follow the growth in the economy in general and changing demographics will have a different impact on the needs for public services. For example, the aging of the population in general could imply less need for teachers, but more healthcare related services. Most interviewees stated that the current surplus in the funds allows the plans to continue to take similar risks as before rather than reducing risk by introducing a liability driven investment

[39] See Bergsma & van Gelderen (2021) for a case study in Ghana

[40] These liabilities are even longer than before as life expectancy moves up gradually.

strategy. The overarching feedback is that strategic asset mixes will not change drastically, but that the funds need to do a better job managing the cashflows on a total fund level. Not managing the cash flows properly could lead to pro-cyclical investment behaviour and negatively impacts the benefits of being a long-term investor.

A long-term investor needs to have the investment flexibility to add value. Most interviewees are of the opinion that the traditional approach of benchmarks and tracking errors is too restrictive. But they also feel that a reference portfolio is not the only way to achieve this flexibility and some interviewees criticize the reference portfolio for shifting too much decision power to management. Moreover, a reference portfolio does not capture any other objectives than maximizing the return within a certain risk budget. For example, sustainability-based objectives are not reflected in the reference portfolio. It is not the strongest argument, because a reference portfolio doesn't exclude other objectives than investment returns either. A more technical problem arises related to the quality of the value add. After all, it's hard to make a normative assessment when the breadth of potential investment choices is left open. Some interviewees emphasized their interest in factor exposures, but only in addition to the traditional asset allocation. A reference was made to the role of the board: "*you can only move as fast as the board allows you to*". For now, not all boards would embrace an asset class agnostic or full factor approach partly due to a lack of technical knowledge to exercise proper supervision.

Most interviewees agree that the first mover advantage has added value in the past, but that over the years private market have attracted many other investors. Private equity is often mentioned in this respect. Yet, despite the enormous inflow of capital into private equity, there is still a strong belief that value is created in turn-around situations[41] and where control premiums can be reaped. Some interviewees point out that the demand for private market assets is driven by institutional investors looking for stable asset valuations. The interviewees are concerned about this trend, because valuations are no longer driven by the economics of the transactions, but by arbitraging different valuation methods resulting in lower risk premiums. This concern doesn't imply that the Maple-8 is going to divest from private market assets. Most interviewees point out that initially value was created by just having the exposure to private market assets, but that the internal teams have developed expertise and skills, which now can be used to better differentiate between good and bad deals. Moreover, the internal teams can assess more complex deals with higher risk premiums. In short: the early mover advantage has turned into a knowledge advantage. The question what the next first mover advantage could be, remained largely unanswered. The most often cited area is related to climate change by means of blended finance, transition finance or sustainable investments. However, it is not seen as a new asset class, but an area of significant growth.

[41] In contrast to financial engineering.

The reactions on the use of new technologies and advanced analytics were lukewarm. The main message was that going forward the Canadian model's investment strategies are still primarily driven by fundamental processes requiring significant human judgement and interpretation. The general feedback is that the benefits of new technologies and advanced analytics are still under investigation. The interviewees do agree that new technologies and advanced analytics could support investment activities to better differentiate between signal and noise, but not necessarily replacing existing processes. Moreover, any competitive advantage is deemed to be short-lived: once the use of big data and advanced analytics has become common practice, the benefits will be marginal. Several interviewees mentioned that the risk function is likely to benefit the most from new technologies and advanced analytics. Part of the thinking is that the current risk practice is backward looking (risk control) using limited historical data and could be better aligned with forward thinking investment decisions (risk management).

Strong support exists for the idea that strategic partners are crucial. The main feedback is that general partners (GPs) will help to find new competitive advantages and provide access to a deal flow that fits the profile of a long-term investor. Yet, it is also appreciated that the relationships with the GPs could come under pressure as the GPs' growth in assets under management outpaces the growth of the Maple-8. All interviewees agree that an adjustment in the traditional relationship is needed to fully benefit from the GP's capabilities and expertise. Several opportunities exist to go beyond the traditional business relationship of allocating capital for a fee, but it does require firm commitments from the LPs too (Monk & van Gelderen, 2019). The idea that the Maple-8 has become a direct competitor for the GPs, because of the shift from fund investments to direct investments, is not supported. On the contrary, it is seen as an opportunity to work closer with the GPs to boost mutual benefits. The idea that the Maple-8 should strive for more strategic cooperation between each other is only picking up slowly. A lot of discussions take place between the Maple-8 on different topics, but formal structures hardly exist yet[42].

The overarching feedback on impact is that the Maple-8's fiduciary duty is to deliver the best investment results possible. Except for CDPQ[43], suggestions to introduce dual mandates were met with scepticism. The overarching statement was that impact cannot come at the expense of investment results. One interviewee stated that there would be a breach of trust in the pension plans if the core focus would replace "value" by "values". But, when impact is defined as explaining how investments affect society at large, interviewees are more inclined to adopt the

[42] The cooperation between PSP and AIMCo in the field of private debt is a good example.

[43] 20% of CDPQ's total portfolio consists of investments in Quebec. This amounts up to approx. C$80b.

concept of impact. Several interviewees link this angle of impact to their license to operate but, yet again, are very wary of opening their mandate for political interference.

3.4 Topics raised by the subject matter experts.

In general, the subject matter experts agree with the Maple-8 executives that the Canadian model has served its purpose well and that a solid foundation is in place. Most experts pointed out that the members of the public pension plans are significantly better off than the ones who are not covered by a public plan. But this situation is potentially a problem too: the Maple-8 doesn't represent the average Canadian[44], but indirectly all Canadians support the public pension systems by means of tax payments. The idea that taxpayers' money is used to support certain groups' pension income whilst the tax burden only increases, could ultimately lead to probing questions. Moreover, the perception that the Maple-8 is only getting 'richer' whilst the average Canadian is faced with a cost-of-living crisis, only adds to the problem. For that reason, several experts pointed out that the governance might be less strong than perceived: although risk tolerance statements are in place and responsibilities are laid out, the system has never been tested. A related key question is what will happen when a fund faces a material deficit. The reputation of the Canadian model will suffer a blow when members are faced with a significant cut in their pension benefits. The sponsor might feel the moral obligation to protect the members, but there is no formal obligation to do so. The general opinion of the experts is that this is a weak point in the set-up of the public pension plans.

The Maple-8 and the subject matter experts both dismiss the idea that the industry is served by self-regulation. Several experts point out that the current model is served by independent and professional boards, but that it could become challenging to find the right candidates when the 'at arm's length' principle is undermined and/or the focus on delivering retirement income comes under pressure. Most experts go further than the Maple-8 by claiming that it's hard to see a future without an independent regulator. The experts see a role for an independent regulator in terms of the entire value chain from pension plan design to investment execution. They emphasize there is a role to play to assess robustness and consistency in terms of level of contributions, pension pay-out, risk tolerance, risk sharing, and the investment strategy. One could argue that these questions are already raised within the current governance model, but an independent regulator is to support and not to replace existing responsibilities. A strong regulator is to advice and influence rather than to dictate and restrict. As such, an independent regulator can help to set the high standards needed for the Canadian model to continue to play its role in society.

[44] CPP is the only fund serving all Canadians, excluding Quebec.

It's undeniable that political pressures exist for the public pension plans to invest more in Canada. Especially after the pandemic, the cry to help the domestic economy has become louder[45]. Most experts argue that this outreach is understandable, but it is not the reason why public pension plans exist. The main goal of the public pension plans is to provide financial security for the members of the plans during retirement. According to most experts, the ability to make independent investment decisions has helped to achieve this goal. The introduction of dual mandates could disrupt the workings of the Maple-8. Moreover, the Canadian stock exchange doesn't provide enough investment opportunities, whilst the existing rules and regulations are considered too rigid to support significant investments in Canadian private markets. Perhaps most important is the question what a dual mandate would look like. The one example is CDPQ, which needs to consider the economic development of Quebec in their investment decisions. CDPQ's experience with a dual mandate is that it doesn't stand in the way of delivering on the pension promise. Anecdotal evidence even suggests that the Quebec investments have higher returns than the rest of the portfolio. But Quebec has a diversified economy, which is not true for all Canadian provinces. With limited investment opportunities, it is not a given that funds in other provinces will be as successful as CDPQ. After all, projects with unfavourable risk-return parameters could be accepted just to meet the mandate of economic stimulus. Long-term, this is not an efficient allocation of capital and not in the best interest of the beneficiaries.

According to several experts, the Maple-8 investors underestimate the impact of new technology and advanced analytics. Many experts believe in the concept of technologized investors to deal with increasing complexities of investing[46]. The fast-growing availability of data, structured and unstructured, provides not only an opportunity to put more proof points in place supporting investment proposals, but also enhances the integrity of the investment process. Especially private market will be impacted by the surge in readily available data. The competitive advantage of information asymmetry will disappear quickly and any premium due to limited dissemination of data will be gone. The explosion in new data can only be analysed with advanced analytics, especially since many trends are only more recent and no historical data is available. The experts expect technology and advanced analytics to play an important role with respect to total fund management and risk management. Sophisticated models and analytics are needed to better predict and gain insights into the behaviour of the total fund under different economic scenarios, market conditions and investment choices.

The subject matter experts emphasized that the mindset of the Maple-8 should remain focused on long-term value creation and continue to invest anti-cyclical. Although liabilities might shorten only gradually, the cash outflow is

[45] Maple-8 investors already have a home bias: there are more investments in Canada than justified by global GDP.

[46] See Monk & Rook (2020) and van Gelderen & Ouellet (2023)

growing. To stay focused on the long term, the short-term cash requirements need to be managed more actively than before. Several experts feel that the current risk practices take the shape of a compliance check (risk control) rather than supporting investment decisions (risk management). The risk metrics used could very well lead to pro-cyclical investment decisions. Moreover, forward looking metrics such as VAR are only short-term at best. Long term risk management must be linked to the overarching objective of the pension plans. In this context, the occupational pension plans are most advanced. A risk approach based on the funded status of the pension plan (shortfall risk) is a better approach but will manifest itself in different ways depending on funding and risk-sharing agreements. For example, a deficit could be covered by reducing the indexation and/or cutting pension benefits, which is a very different situation in which the sponsor is fully responsible. A different angle again is to express risk in terms of the stability in contribution rates. In terms of investments, suggestions were made to focus on less crowded parts of the investable universe and that the Maple-8 should become more thematic investors rather than asset allocators. There is sympathy for the use of a reference portfolio to stimulate innovation, but the experts also expect challenges around governance and the benchmarking of the performance. Yet, some experts suggested that an independent regulator could play a role in supporting the board in these matters.

The subject matter experts clearly point to climate change and the green transition as the new first mover advantage or the next competitive edge for providers of patient capital. It is a topic requiring a long-term thematic outlook, whilst the science is under development leading to innovation and new insights. Asset pricing models are still under development, which means that for now large risk premiums are priced in[47]. It is also clear that significant amounts of money are required for the transition. As patient capital providers pension plans are well positioned to play a dominant role and it will support their license to operate. But the experts also point out some challenges. Specific expertise and knowledge need to be built up and/or attracted from the market. These skills are highly in demand and the pension plans need to compete with the market. Given its experience with the build-up of internal investments teams, the Canadian model is well positioned to cope with these challenges.

4.0 Final comments and afterthought

The Canadian model is over a couple of decades old and has delivered good results. Most of the Maple-8 are in surplus, which will help to deal with the retirement of the baby boomers between 2020 and 2040 as planned thirty years ago. The overarching driver of the Canadian model as an investment model has been the focus on value

[47] Except for certain green products. A similar situation exists as the demand for private assets: it's not the underlying that matters, but rather the green label. The strong demand for these products leads to overshooting in terms of valuation.

creation and its entrepreneurial mindset to come up with innovative investment solutions (Betermier et al, 2023). The characteristics of the model must be seen in this perspective. A clear objective, professional boards and an at arms' length investment function created the required flexibility to find the best investment solutions and opportunities. In-house management and proper compensation allowed to build up the required skills and know-how, whilst private markets and alternatives were a source of additional value. Every Maple-8 institution has made use of this environment in its own unique way. Keeping the focus on value creation and the entrepreneurial mindset is key to remain successful.

The central question in this paper was whether the current state of the Canadian model is strong enough and/or needs change. Given that the foundation of the Canadian model was put in place decades ago, it is not a given that all stakeholders still understand. Moreover, if future performance falls below historical performance[48], more short-term scrutiny and even questions why these institutions exist will come up. Short-termism is the enemy of the Canadian model and could lead to an underinvestment in innovation and pro-cyclical investments (World Economic Forum, 2011; Barton & Wiseman, 2015; FCLT Global, 2020). This would harm economic growth and the Maple-8 would no longer play a stabilizing role in Canada's financial system (Bédard-Pagé et al, 2016). In this scenario it is not unlikely that the current governance structure comes under pressure with sponsors and/or stakeholders trying to influence the investment decisions and/or use pension assets for economic development[49]. Except for CDPQ, the public pension funds were not set up to boost Canada's economic development. A formal requirement to invest more in Canada could adversely affect the main objective of retirement security if the investment opportunities are less attractive than foreign investments and/or the investments in Canada come at the expense of diversification. Moreover, more direct involvement from the sponsors could weaken the position of the Boards too. Many professionals might no longer be interested in a board position at a public pension fund, further undermining the strength of the current model. To cope with these challenging scenarios, the Maple-8 should work together to better promote its achievements and to reaffirm its license to operate. Part of this effort is to work with the federal and provincial governments to improve the investable landscape in Canada[50].

Going forward, two main development areas can be identified to strengthen the current Canadian model. None of these areas are strongly embedded in the investment beliefs and were not eminent topics of the discussions during

[48] It is undeniable that the Maple-8 also benefitted from the secular decline in interest rates from over 12% to almost 0% over the last thirty years. Hence, it will be difficult if not impossible to show the same investment performance when interest rates are on a rising path.

[49] See Canadian Fall Economic Statement 2023.

[50] The growing geopolitical risk in different parts of the world could very well work in Canada's favor. Whereas other parts of the world could experience rising geopolitical risk premiums, Canada could benefit from its relatively stable environment.

the interviews. The first development area relates to long-term risk management. As Shepard (2022) points out, conventional wisdom based on short-term market volatility leads to asset allocations which are not in the best interest of long-term investors[51]. Campbell and Viceira (2002; 2005) already showed that equity risk for long-term investors is significantly lower than for short-term investors. Due to mean reversion in equities, the volatility drops from approximately 17% on a 1-year basis to only 8% on a 25-year basis. In contrast, re-investment of coupons and redemptions make bonds riskier than perceived[52]. Short-term risk measures as VAR are easy to implement but do not capture the long-term dynamics and include much market noise. Macro events and regime changes are more impactful on the funding status of pension plans than short-term market volatility. Obviously, relying on longer-term measures feels less comfortable as it can be seen as a leap of faith rather than a serious attempt to control the market environment. Yet, the key message is that risk management should be focused on managing the funding risk using the right signals rather than market noise. Providing retirement security implies that the funds must be resilient[53] and able to withstand significant headwind, which goes beyond having robust investment portfolios in place. A robust portfolio implies that the portfolio continues to perform under different market scenarios, whilst resilience relates to extreme events or shocks that could seriously impair the license to operate[54]. These extreme events asked for drastic measures to keep the financial status of the pension plan sound, especially since sponsors do not have unlimited capacity to support their pension plans. Hence, in addition to solid liquidity management and long-term risk metrics[55], concrete plans need to be developed to make the fund more resilient.

The second development area is the use of new technologies and advanced analytics. The investment environment has become simply too complex to manage without technology and advanced analytics. Artificial intelligence, and machine learning in particular, is considered the third revolution after the industrial revolution and the information revolution. Without going into the specifics, artificial intelligence is about efficiency and prediction. The efficiency gains are linked to the ability to the process[56] huge amount of data. For example, finding communalities or exceptions in different bond documents used to be a time-consuming activity, but this activity can be automated

[51] The Shepard paper provides a framework how future macro shocks (supply, demand, trend growth, central bank policy and long-term real rates) could impact asset returns, including private assets, over long horizons.

[52] The constant changing volatility in T-bills during 1952-2002 made this perceived low risk investment even riskier than a long-term mean-variance portfolio.

[53] See Rook (2021) for a manifesto on the concept of long-term resilience.

[54] For example, the long-lasting declines in equity markets during the dot.com crisis and the Global Financial crisis seriously impacted the funding ratio and could have led to drastic reforms. Yet, the recovery in markets 'rescued' the funds.

[55] Scaling up short-term risk metrics does not lead to proper long-term risk metrics

[56] With natural language processing (NLP) text documents can be comprehended, analyzed, summarized, classified, translated etc. It is based on large language models (LLM).

with the latest technologies leading to significant time savings and an opportunity to allocate resources to activities with more value add. Generative AI can be seen as an extension of this as it aims to generate new insights. A critical stance is still needed, because output might not be grounded in the input used by the algorithm (so-called hallucinations). The predictive power of machine learning in investments is still under review as well. Several studies (a.o. Gu et al, 2020; Swinkels & Hoogteijling, 2022) have shown that machine learning predictions are better than traditional techniques, but it is not clear whether these better predictions will lead a structural better performance. After all, once the market at large has access to better predictions, it is a level playing field again. The challenge with machine learning applied to investments is that most data bases are not large enough to generate meaningful results. Moreover, the signal-to-noise ratio is low[57], which only puts more emphasis on materially large data sets, which is hindered by the nonstationary nature of financial data. Hence, it is no surprise that most of the successful examples are based on situations with relatively large and stable data sets, such as currency markets and high-frequency trading. Yet, AI should not be ruled out because of limited successes thus far. New technologies and advanced analytics make the industry less dependent on historical data alone and provides huge opportunities to determine associations and correlations we were not aware of before. As such, AI application could be found, amongst others, in alpha-generation, total fund management, risk management, and trading. The task for the Maple-8 is to figure out how they will benefit the most, which is dependent on their specific situation and mandate.

What remains is the following afterthought. Former Governor of the Bank of Canada, Stephen Poloz (2023), talks about the renaissance of defined benefit pensions in a world full of uncertainty. Although many people believe that defined benefit plans are not sustainable due to increasing dependency ratios[58], the real problem finds its cause in insufficient contributions and/or not enough buffers as surpluses were used to increase benefits. Ultimately every member should pay enough contributions to cover its own retirement needs, whilst the pooling of investments and the embedded solidarity provides more stability and a means for additional risk taking. A further move to a defined contribution system will only create a social catastrophe in due course. Due to the lack of financial literacy, individual households will not save enough for their retirement. Ultimately, lower than expected replacement rates will put pressure on future governments to increase pension provisions in pillar 1 and pillar 2. However, the ability to support social security programs out of tax income is under pressure, given that the dependency ratio is only going up. Moreover, a high debt burden stands in the way too. Hence, the need for a broad-based defined benefit pension in pillar 3, which would also move Canada up in the Mercer rankings. The Maple-8 is well positioned to give substance to such a development.

[57] See previous comment on risk management: VAR calculations are based on low signal-to-noise data.

[58] Number of retirees vs number of workers

References

Ambachtsheer, K. (2016). The Future of Pension Management; Integrating Design, Governance, and Investing. John Wiley & Sons Inc., Hoboken, New Jersey

Ambachtsheer, K. (2021). The Canadian Pension Model: Past, Present and Future. The Journal of Portfolio Management, 47(5). DOI: 10.3905/jpm.2021.1.216

Aziz, S. & Dowling, M. (2019). Machine Learning and AI for Risk Management. In: Disruptive Finance, Palgrave Studies in Digital Business & Enabling Technologies.

Barton, D. & Wiseman, M. (2015). Perspectives on the Long Term. McKinsey Quarterly, March 2015.

Beath, A.D., Betermier, S., Flynn, C. & Spehner, Q. (2020). The Canadian Pension Fund Model: a Quantitative Portrait. Available at: https://ssrn.com/abstract=3661876.

Beath, A.D., Betermier, S., van Bragt, M. & Liu, Y. (2022). Green Urban Development: The Impact Investment Strategy of Canadian Pension Funds. Available at: https://ssrn.com/abstract=3853175.

Bédard-Pagé, G., Demers, A. Tuer, E. & Tremblay, M. (2016). Large Canadian Public Pension Funds: a Financial System Perspective. Bank of Canada, Financial System Review.

Bergsma, G. & van Gelderen, E. (2021). The Relevance of the Canadian Model for African Pension Plans: a Case Study in Ghana. The ISM Journal of International Business, vol. 4, issue 1.

Betermier, S., Byrne, N., Fontaine, J., Ford, H., Ho, J. & Mitchell, C. (2021). Reaching for yield or resiliency? Expaining the shift in Canadian pension plan portfolios. Bank of Canada, Staff Analytical Note 2021-20.

Betermier, S., van Gelderen, E. & Zvan, B. (2023). Five Examples of Direct Value Creation and Capture in the Pension Fund Industry. Available at: https://ssrn.com/abstract=4616266.

Boston Consulting Group (2013). The top ten; investing for Canada on the world stage. Available at: https://www.cppinvestments.com/public-media/headlines/2016/cppib-bcg-2016

Campbell, J.Y. & Viceira, L.M. (2002). Strategic Asset Allocation; Portfolio Choice for Long-Term Investors. Oxford University Press.

Campbell, J.Y. & Viceira, L.M. (2005). The Term Structure of the Risk-Return Trade-Off. Financial Analysts Journal, 61:1. DOI: 10.2469/faj.v61.n1.2682.

Dixon, A.D. (2008). The Rise of Pension Fund Capitalism in Europe: un Unseen Revolution? Oxford University. Available at: http://ssrn.com/abstract=1090860

Dyck, A. & Pomorski, L. (2011). Is Bigger Better? Size and Performance in Pension Plan Management. Available at: http://ssrn.com/abstract=1690724

FLCTGLOBAL (2020). Funding the Future: Investing in Long-Horizon Innovation. Report.

van Gelderen, E. & Bergsma, G. (2021). The Relevance of the Canadian Model for African Pension Plans; a Case Study in Ghana. The ISM Journal of International Business, vol 4, issue 1.

van Gelderen, E. & Ouellet, D. (2023). Technology Supported Investment Management, In Sustainability, Technology and Finance; Rethinking how Markets Integrate ESG, edited by Bril, Kell & Rasche. Routledge.

Gros, B. & Sanders, B. (2019). The Quest for Sustainability in Contingent Pension Plans. C.D. Howe Institute, Commentary 553.

Gu, s., Kelly, B. & Xiu, D. (2020). Empirical Asset Pricing via Machine Learning. Review of Financial Studies, 33(5)

IMF (2019). Canada: Financial System Stability Assessment. IMF Country Report No. 19/177

Israel, N., Kelly, B. & Moskowitz, T. (2020). Can Machines "Learn" Finance? Journal of Investment Management, 18, 2

Ivashina, V. & Lerner, J. (2018). Looking for Alternatives: Pension Investments around the World, 2008 to 2017. Harvard Kennedy School, Mossavar-Rahmani Center.

Jaeger, R.A., Rausch, M.A. & Foley, M. (2010). Multi-Horizon Investing: A New Paradigm for Endowments and Other Long-Term Investors. The Journal of Wealth Management, 13.1.

Koedijk, K. & Slager, A. (2011). Investment Beliefs; A Positive Approach to Institutional Investing. Palgrave Macmillan

Leech, J. & McNish, J. (2013). The Third Rail: Confronting Our Pension Failures. Signal.

Lipschitz, C. & Walter, I. (2020). Public Pension Reform and the 49th Parallel: Lessons from Canada for the U.S. Stern School of Management, New York University.

Lucas, D.J. & Zeldes, S.P. (2009). How Should Public Pension Plans Invest? American Economic Review, 99:2. DOI: 10.1257/aer.99.2.527

McQuillan, L.J. (2015). California Dreaming: Lessons on How to Resolve America's Public Pension Crisis. The Independent Institute.

Mendelson, M. (2005). Financing the Canada and Quebec Pension Plans. Caledon Institute of Social Policy, #2005-18

Mercer (2022), Mercer CFA Institute Global Pension Index. Available at: https://www.mercer.com/our-thinking/global-pension-index-2021.html

Monk, A.H.B. & Rook, D. (2020). The Technologized Investor; Innovation through Reorientation. Stanford University Press

Monk, A.H.B. & Rook, D. (2023). The 'Investor Identity': the Ultimate Driver of Returns. Stanford Research Initiative on Long Term Investing

Monk, A.H.B. & van Gelderen, E. (2019). Knowledge Management for Investors: Filling Knowledge Gaps via Networking and External Partnerships. Available at: http://ssrn.com/abstract=3331643.

Poloz, S. (2023). Pensions in the next age of uncertainty. Available at : https://hoopp.com/home/pension-advocacy/research.

Rook, D., In, S.Y. & Monk, A.H.B. (2021). The Resilience Manifesto: Integrating ESG and Risk Management, in Investment Portfolios and Organizations. Available at: http://ssrn.com/abstract=3942909.

Rozanov, A. (2015). Public Pension Fund Management: Best Practice and International Experience. Asian Economic Policy Review. DOI: 10.1111/aepr.12106

Rozanov, A. (2017). Public Sector Investment Funds: How the Best-in-Breed Evolved. Center on Japanese Economy and Business, Working Paper Series February 2017, No.1

Shepard, P. Tiantian, G.Q. & Li, D. (2022). Building Balanced Portfolios for the Long Run. Available via https://www.msci.com/research-and-insights

Swinkels, L. & Hoogteijling, T. (2022). Forecasting Stock Crash Risk with Machine Learning. Whitepaper, Robeco.

World Bank (2017). The Evolution of the Canadian Pension Model; Practical lessons for Building World-Class Pension Organizations.

World Economic Forum (2011). The Future of Long-Term Investing. A World Economic Forum Report.

Appendix I Maple-8 Institutions

- Canadian Pension Plan Investment Board, CPPIB, was established in 1997 as a crown corporation and manages the funded part of the Canadian Pension Plan (CPP). As pillar 2 is primarily based on a PAYG system, the funded part of pillar 2 has no specific solvency requirements. Moreover, as pillar 2 is expected to exist forever and no immediate claim on the funded part exists, the investment horizon is very long.
- Public Sector Pension Investment Board, PSPIB, was established in 1999 as a crown corporation to manage the asset transfered by the federal government. These assets relate to the four pension plans within the Canadian government: the Public Service, the Canadian Forces, the Royal Canadian Mounted Police and the Reserve Force. Currently, the assets are pooled and managed as part of just one mandate[59]. As the assets only cover the post-2000 liabilities, PSPIB's investment horizon is very long. The pre-2000 pension liabilities are funded on a PAYG basis and therefore not part of PSPIB's mandate.
- Caisse de dépôt et placement du Québec, CDPQ, was established in 1965 as a provincial crown corporation and has a dual mandate: manage the funds of its depositors and to contribute to Quebec's economic development. The company manages the Quebec Pension Plan (QPP) and the funds of 47 other depositors. The majority being pension plans, but also insurance plans and special purpose funds.
- Alberta Investment Management Corporation, AIMCo, was established in 2008 as a crown corporation to manage the assets of 30 pension plans, endowments and other government funds in the province of Alberta. The Local Authorities Pension Plan (LAPP) is the largest depositor.
- British Columbia Investment Management Corporation, BCImc, was also established in 1999 as a crown corporation managing third pillar public funds in British Columbia. Similar to AIMCo, it serves a variety of different clients: 11 pension plans, three insurance companies and 17 special purpose funds. The Municipal Pension Plan is its largest pension client.
- Ontario Teachers Pension Plan, OTPP, was launched in 1990 to administer the pension for schoolteachers in Ontario. It's a occupational pension plan with different perticipating employers, amongst others the Ontario Ministry of Education, designated private schools and other designated organizations.
- Healthcare of Ontario Pension Plan, HOOPP, is another occupational plan in Ontario covering the healthcare workers. It was estiblished in 1960 as a multi-employer pension plan with currently around 630 employers, including hospitals, family & community health teams and other healthcare organizations.

[59] This might change over time and each pension plan could have its own mandate. This move could be justified as the liabilities and pension plan differ, but it's questionable whether this lead to any benefits to the government given the clear differences in size of the plans.

- Ontario Municipal Employees Retirement System, OMERS, was established in 1962. Participating employers are employers that work in the local municipal government and local municipal board sector, as well as employers providing a municipal service or program.

Appendix II Board Composition

The responsibility and oversight of the pension funds is delegated to the Boards of the Maple-8, which placed the investment activities at arm's length from the sponsors. The sponsors keep indirect influence by appointing the board members. CPPIB's twelve Board members are appointed by the federal Finance Minister in consultation with all participating provinces: each province has one representative. The Chair of the Board is designated by the Governor in Council on the recommendation of the Minister. PSPIB Board members and the Chair are appointed by the Governor in Council on the recommendation of the President of the Treasury Board. AIMCo Board appointments go via the Lieutenant Governor in Council. BCImc's four statutory pension plans appoint one board member each, whilst the finance minister in British Columbia appoints three board members and the chair. The board members consist of two former stakeholders, three sponsor representations and two union representations. In the case of CDPQ, the dual mandate to also support the Quebec economy in addition to their investment mandates, leads to an additional dimension in the Board's oversight. The Quebec government is responsible for Board appointments in consultation with the CDPQ Board. The number of Board members can range between nine and fifteen. Two-third is expected to consist of independent members, whilst one-third will consist of former stakeholders and CDPQ's CEO. The occupational funds have a different governance again. Once a sponsor has become a member of the occupational pension fund, the pensions are no longer part of their collective bargaining process with the unions. But the unions do have a significant role in the board of the management company. OTPP It is sponsored by the Government of Ontario and the Ontario Teachers' Federation. The Ontario government selects five Board members as does the Ontario Teachers' Federation. The Chair of the Board is jointly selected. With sixteen members HOOPP has the largest board among the Maple-8. Eight directors are appointed by the Ontario Hospital Association (OHA) and eight directors by four different unions[60] (two each). The board consists of six professional directors, one former stakeholder, one employer representative and eight unions representatives. OMERS' governance is relatively complex as the company is managed by two boards. The OMERS Sponsors Corporation (SC) is responsible for designing pension benefits[61] and for establishing the level of contributions[62]. OMERS' Administration Corporation (AC) however is responsible for setting the discount rate and the investments. Obviously, the two roles cannot be seen independent from each other, but the objectives might very well differ. Moreover, the members are unionized, and different unions might have different objectives too. The SC board has 14 members, equally split between members appointed by employers and by unions and associations.

[60] the Ontario Nurses Association, the Canadian Union of Public Employees, the Ontario Public Service Employees Union, the Service Employees International Union.

[61] Changes in plan design requires 2/3 of the votes.

[62] A deficit requires an increase in the contribution rate, which is spread out over 15 years.

The AC board also has 14 members plus an independent chair. The members are appointed by the SC but nominated by sponsor organizations. The AC's independent chair is appointed by the SC in consultation with the AC board. Management reports into the AC.

		CPPIB	PSP	AIMCo	BCImc	OTPP	OMERS
Footprint		• Long-term investing can provide opportunities for greater rewards	• Patient capital creates opportunities to pursue strategies known to be rewarded over sufficiently long horizons	• Our goals should align with client objectives	• Successful investment managers capitalize on their competitive advantages	• Our investment strategy considers our risk profile, our plan assets and our liabilities • The Ontario Teachers' brand is a strong and valuable asset	• We manage our investment assets in the best interests of our members and beneficiaries as a whole and consistent with our fiduciary duty • Liabilities are the key driver of our investment strategies • A long-term investment horizon is an advantage.
Inputs	AuM	•	•	•	•	•	•
	Process	• Sound diversification of assets and exposures builds resilient portfolios • Active selection of individual investments can outperform passive market participation • Strategic positioning can create value and reduce risk • Strong relationships support our success: we identify and cultivate relationships with like-minded partners globally to broaden our investment reach. • Taking on risk is inseparable from maximizing long-term returns.	• Effective Total Fund portfolio construction is fundamental to meeting the objectives of PSP's sponsor • Both diversification & diversity of approaches lead to an optimal expected risk/return profile • Effective execution with well-structured processes increases our chances of success as an investor • Identifying, monitoring and capitalizing on environmental, social and governance (ESG) factors is material to long-term investment performance	• Return and risk are best managed across all investments • Our comparative advantages are cash and patience • Good governance has a return: there are good business reasons for companies to act responsibly. We may use our influence as shareholders to improve business practices. • Investment strategies must respond to change: good investment ideas don't last forever. There is a reward for spotting new opportunities early. Some of the best opportunities do not fit asset class silos • Our easiest return is money we do not have to spend; managing internally is more cost-effective with the right expertise. Strong operational support can avoid costly operational errors.	• Asset mix is the main determinant of portfolio risk and return; it is reasonable for investors to expect higher long-term returns for holding risky assets or asset classes • Investor behavior affects capital markets and short-term asset prices; over the long term, earnings drive asset values • Foreign currency exposure provides important diversification benefits	• Total fund diversification, through effective portfolio construction, is fundamental to our success • Innovative strategies and our long-term horizon are powerful investment tools when used with sound risk and liquidity management • Good governance is good business and contributes to sustainable values: we continually consider all risks in our investment process, including those related to environmental, social and corporate governance factors. We expect management teams and boards of directors to be responsive to their shareholders. We lead by example. • Investing is a business. As such, our results are net of our costs.	• Our long-term strategic asset mix is the key determinant of our overall risks and return. • Long-term value creation is maximized through direct investment strategies and effective management of human capital: direct drive, active management is cost-effective and enhances investment results • Effective management of financial capital includes the use of leverage and derivatives. • Costs matter and need to be managed
	People	• Our people drive our success	•	• We are risk managers: risk is our scarce resource, to be deployed where it will earn the highest return.	• Skill matters: skills are the foundation for successful long-term investment returns	•	•
	Information	• Incorporating non-market and emergent factors into decision-	• Financial markets are not perfectly efficient and active management can add value	• Active management can be an important source of return	• Capital markets have varying degrees of efficiency and are	• We engage in active management, with a global perspective, to earn higher	• Environmental, social and governance ("ESG") factors can

		making creates more sustainable value • Capital markets provide opportunities for advantaged investors to generate superior returns	• Securing collective knowledge, through a combination of internal resources and external partnerships, is necessary to drive value creation in active management		impacted by long-term themes and sector/industry trends. • Environmental, social, and governance matters make a difference	returns because we believe markets can be inefficient • The returns we can expect will not be constant over time	have a material impact on long-term investment performance
Enablers	Technology						
	Culture	•	•	• Taking a risk has a persistent long-term reward	• Our continued success depends on using our best judgement and making ethical decisions that are aligned with our core values of integrity, accountability, team cohesiveness and transparency	• Taking risk is necessary to earn the returns required to meet our pension obligations	• Achieving our investment goals requires us to assume risk and accept that periodic losses can arise
	Governance	• World-class governance, accountability and risk management strengthen delivery of maximized returns at appropriate levels of risk	•	•	•	•	• Articulating our investment goals and performance measures helps ensure clear accountability