

Public Pension Reform and the 49th Parallel: Lessons from Canada for the U.S.

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ABSTRACT

Public employee pension systems around the world show remarkable diversity in design and execution. Among these, the U.S. defined benefit public pension system has drawn increased attention because of questions about the long-term sustainability of many of the underlying pension funds – as well as concerns of equity between pension plan members, retirees, taxpayers, bondholders, and users of public services. The Covid-19 pandemic introduced new fissures in state and local government finances, heightening the need to bolster long-term public pension fund robustness. As an alternative model, the Canadian public pension system is widely respected. This was not foreordained. The authors trace difficult decisions undertaken in Canada in the 1980s and 1990s along with essential descriptive features of the Canadian Model. Using a novel primary dataset, the authors benchmark the 25 largest U.S. plans against their ten largest Canadian peers, exploring key issues in a paired analysis. The authors extract fundamental lessons from the Canadian experience, proposing a roadmap for reform of the U.S. public pension system. They argue that long-term pension sustainability, once politically prioritized, must be built on equity and discipline in plan design, funding, and amortization of existing deficits. They emphasize the importance of legal framework, particularly joint sponsorship, alongside enhanced governance and unified legislation. They also draw lessons from the Canadian experience with respect to enhanced investment organizations and investment strategies.

Keywords: Public pension funds, Public finance, Municipal finance, State and local government debt, Retirement security, Comparative government retirement systems, Pension reform, Canadian pension system, Canadian Model, Institutional investors, Paired analysis.

JEL Classification: G230, H7, J38, J45.

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1 INTRODUCTION

In the late 1970s, a Presidential Commission during the Carter administration conducted a two-year study of U.S. pension systems (private and public). In its subsequent report to President Reagan and the U.S. Congress, the Commission made particular reference to state and local government pension plans, noting that “...concerns relating to the ownership and control of pension fund assets are among the most important social and economic public policy issues facing the Nation in the upcoming decades... [the] Commission recommends that Congress and the President continue research and policy development; and to encourage public debate... recommends the establishment of a Presidential Commission.”¹

That second commission to study public pension plans was never established. However, a great deal has been learned in the intervening years about the sustainability of public pension systems and the causes and consequences of errors in employee and employer contributions, promises to beneficiaries, and estimated rates of return.

In a previous study² we provided a structural overview of the U.S. public pension system based on a quantitative analysis – using a new primary dataset covering the 25 largest U.S. pension plans. These account for more than half of all public pension assets in the country.

Public pension systems are complex structures. Their impact on the economy is not fully understood – particularly in terms of market structure. There are approximately 5,300³ distinct U.S. public pension funds, covered by relatively limited analytics at the national level.

U.S. public pension funds control \$4 trillion in assets.⁴ The system is financially massive, and its underfunding – which we detail herein – may well be approaching a tipping point, albeit to a different degree in different states. The Covid-19 pandemic of 2020 may well transform a public finance challenge into a crisis at the center of policy debates.

Public pension funds have four sets of stakeholders that can be defined as “principals” – beneficiaries, taxpayers, bondholders, and users of public services. Pension fund governance has primarily focused on interests of the first of these stakeholders, with risks to the others much more opaque. Given competing public finance needs, pressure on state and local government fiscal resources is a virtual constant. That pressure has been exacerbated by the Covid-19 pandemic and its dramatic erosion of tax revenues even as governments are encouraged to increase public expenditures. Meanwhile, pension plan assets have been eroded by financial market shocks. All the while, most states are required to balance their budgets. And if challenges become insurmountable, the option for states to restructure public debt through a bankruptcy process does not exist.⁵

Consequently, there have been repeated calls for reform of the pension system over the years. The 2020 pandemic and its waterfall of impacts have made these calls more urgent. What are the options?

We will argue that Canada provides valuable lessons for the United States. While not perfect, the Canadian defined benefit public pension system is generally well regarded. That was not always the case. Through the 1980s and into the early 1990s, the country’s public pension system was a cause for concern among informed policymakers at both the provincial and federal

levels. One by one, the individual pension funds and their regulators restructured the system, introducing a series of changes that have proven both effective and sustainable.⁶

We analyze the structural design and execution undertaken in Canada – its historical antecedents and subsequent evolution. We survey key aspects of the Canadian public-sector pension model. Using primary datasets for the largest Canadian and U.S. plans, we provide a cross-sectional comparison between the two systems. This paired analysis provides a useful lens to evaluate the positive impact of transformative changes undertaken in Canada. It brings into focus the necessity and potential value of public pension reform in the U.S. and provides a roadmap for such reform.

Our objective is to provide sensible and practical ideas for U.S. policymakers at the state and local levels, for federal officials concerned with the solvency of state and local governments,⁷ and for stakeholders with a direct interest in strong public pension finance.⁸ Indirect stakeholders that service public pension funds – actuaries, investment consultants, asset managers, and legal advisors – will also find value in this study.

The first section of this article profiles the development and attributes of the Canadian public pension system at the national and provincial levels, using the Canada Pension Plan as well as Ontario and Alberta as examples. It proceeds to draw Canadian-U.S. comparisons in plan design, discount rates, funded status, investment organization and strategy, and investment performance. The final section lays out the important lessons of the paired analysis for U.S. public sector pension systems, along with key policy recommendations.

2 WHY CANADA?

It is widely accepted that the Canadian public pension system functions well, with enviable funding levels.⁹ Indeed, the so-called “Canadian Model” of pension management is often seen as a global gold standard in the realm of public finance.¹⁰

This was not always the case. In the early 1990s, the Canada Pension Plan (CPP) and the various provincial public pension plans were financially challenged. Their subsequent successes were hardly inevitable or predictable at the time. CPP was structured as a pay-as-you-go system and many of the provincial plans were funded through superannuation accounts.¹¹ They were not independent of government and invested largely in Canadian sovereign and provincial debt.

Here we review a series of key changes undertaken in Canada in the late 1980s and during the 1990s, allowing us to compare key plan features in both countries. Using a side-by-side analysis of primary data sources, we illustrate the positive impact of reforms on Canadian public pension funds relative to those in the U.S. Inevitably, difficult policy decisions had to be taken. Public officials in Canada took many of these decisions over three decades ago. The U.S. has the benefit of learning from that experience as a roadmap for the future solvency of its public pension funds – with lessons for public finance across the country.

In order to compare the public pension systems of Canada and the U.S., we rely on a primary dataset sourced directly from the public filings of the largest public pension systems in each country. For Canada, the sample includes nine of the largest public pension plans¹² and the Canada Pension Plan.¹³ For the United States, the sample comprises the twenty-five largest public

pension plans.¹⁴ Our dataset is sourced from eleven years of annual reports for these 35 pension plans ending in 2018, and in aggregate includes more than 25,000 distinct observations. Exhibit 1 and Exhibit 2 detail the Canadian and U.S. pension systems included in our study, while Exhibit 3 ranks the thirty-five pension systems by net plan assets. Exhibit 4 provides comparative national statistics for the two countries. Our entire dataset is as of fiscal year end, 2018.

EXHIBIT 1

Largest Public Pension Plans in Canada

Pension System	Acronym	Jurisdiction	Plan Assets (USD mm)	Funded Status (%)	Plan Members	Fiscal Year End
Canada Pension Plan	CPP	National	279,843	N/A	Population	Mar
Ontario Teachers' Pension Plan	OTPP	Ontario	140,142	109.60%	327,000	Dec
Public Service Pension Plan	PSP	Federal	87,036	120.70%	607,587	Mar
Ontario Municipal Employees Retirement System	OMERS	Ontario	71,452	97.50%	496,000	Dec
Healthcare of Ontario Pension Plan	HOOPP	Ontario	57,945	121.30%	357,268	Dec
Municipal Pension Plan	BCMPP	British Columbia	38,706	108.60%	348,690	Dec
Local Authorities Pension Plan	ABLAPP	Alberta	32,609	108.50%	265,813	Dec
British Columbia Public Service Pension Plan	BCPSPP	British Columbia	24,495	115.60%	127,294	Mar
Teachers' Pension Plan	BCTPP	British Columbia	20,801	108.90%	98,805	Dec
Ontario Pension Board	OPB	Ontario	19,477	93.40%	89,300	Dec

Includes Canada Pension Plan and nine largest public pension plans in Canada excluding those in the province of Québec. The jurisdiction of Canada Pension Plan is national, excluding Québec. Canada Pension Plan is funded on a partial pay-as-you-go basis and hence its funded status is not comparable with that of the other pension plans in the sample. Liabilities of PSP incurred before April 1, 2000 are funded by way of a superannuation account and appear as a liability of Canada to the pension plan. Liabilities from April 1, 2000 are funded. Canadian dollar values are converted to U.S. dollars as at the end of the fiscal year of each pension plan.

Source: Annual reports of pension plans.

EXHIBIT 2**Largest Public Pension Plans in the U.S.**

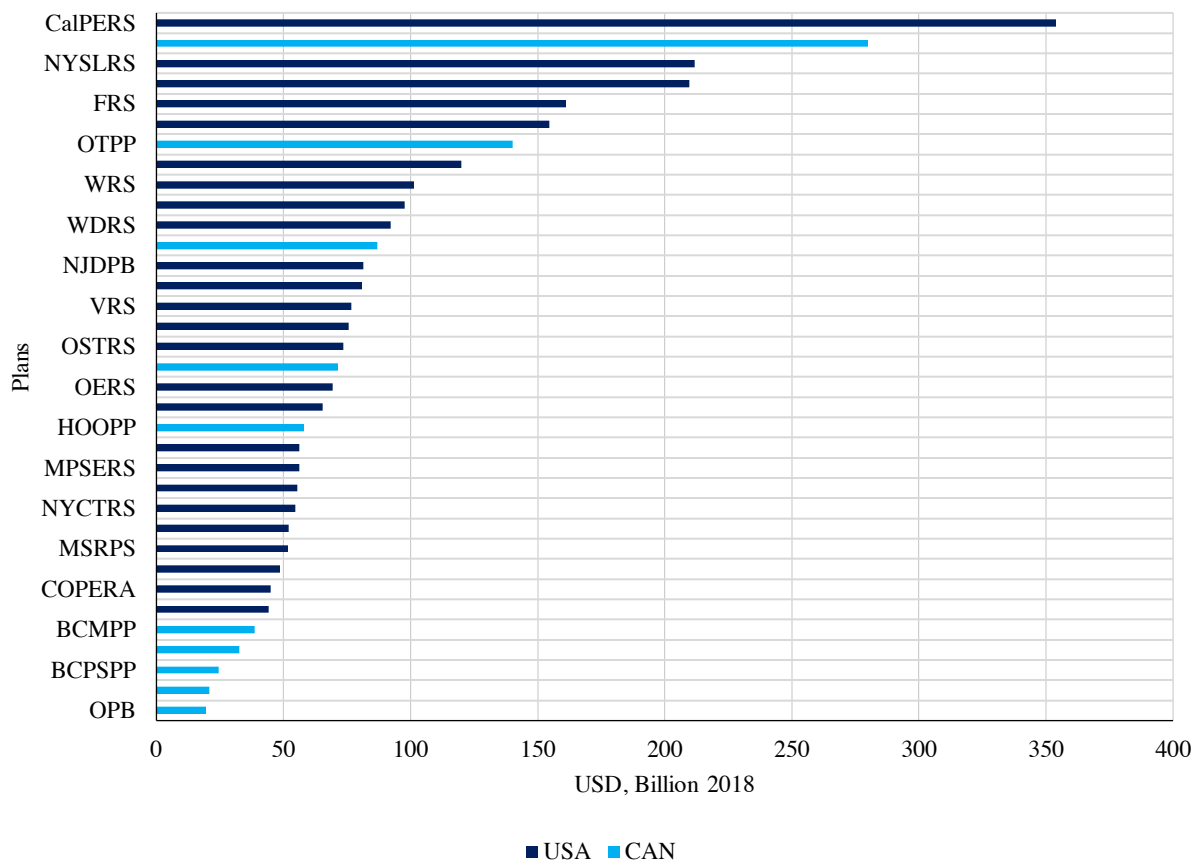
Pension System	Acronym	Jurisdiction	Plan Assets (USD mm)	Funded Status (%)	Plan Members	Fiscal Year End
California Public Employees' Retirement System	CalPERS	California	353,996	70.10%	1,958,888	Jun
New York State and Local Retirement Systems	NYSLRS	New York	211,833	97.40%	1,122,626	Mar
California State Teachers' Retirement System	CalSTRS	California	209,779	70.50%	949,370	Jun
Florida Retirement System	FRS	Florida	161,197	86.70%	1,210,795	Jun
Teacher Retirement System of Texas	TexasTRS	Texas	154,569	77.20%	1,566,485	Aug
New York State Teachers' Retirement System	NYSTRS	New York	119,916	100.90%	430,875	Jun
Wisconsin Retirement System	WRS	Wisconsin	101,449	100.00%	641,892	Dec
North Carolina Retirement Systems	NCRS	North Carolina	97,588	88.60%	1,028,244	Jun
Washington State Department of Retirement Systems	WDRS	Washington	92,057	93.90%	323,491	Jun
New Jersey Division of Pension & Benefits	NJDPB	New Jersey	81,527	50.20%	765,347	Jun
Ohio Public Employees Retirement System	ERSOhio	Ohio	80,877	74.40%	1,118,397	Dec
Virginia Retirement System	VRS	Virginia	76,555	78.90%	706,045	Jun
Teachers Retirement System of Georgia	GTRS	Georgia	75,533	80.30%	360,431	Jun
State Teachers Retirement System of Ohio	OSTRS	Ohio	73,458	75.80%	465,824	Jun
Oregon Public Employees Retirement System	OERS	Oregon	69,328	86.80%	367,853	Jun
New York City Employees' Retirement System	NYCERS	NYC	65,450	78.60%	376,609	Jun
Los Angeles County Employees Retirement Association	LACERA	LA County	56,300	82.20%	163,365	Jun
Michigan Public School Employees' Retirement System	MPSERS	Michigan	56,285	67.50%	442,948	Sep
Pennsylvania Public School Employees' Retirement System	PSERS	Pennsylvania	55,551	53.90%	489,650	Jun
Teachers' Retirement System of the City of New York	NYCTRS	NYC	54,532	74.50%	209,000	Jun
Teachers' Retirement System of the State of Illinois	ILTRS	Illinois	51,970	40.90%	417,292	Jun
Maryland State Retirement and Pension System	MSRPS	Maryland	51,827	71.40%	405,106	Jun
Tennessee Consolidated Retirement System	TCRS	Tennessee	48,727	96.10%	543,069	Jun
Colorado Public Employees' Retirement Association	COPERA	Colorado	44,907	58.30%	575,617	Jun
Public Schools Retirement System of Missouri	MPSRS	Missouri	44,029	84.30%	256,660	Jun

Twenty-five largest public pension plans in the U.S.

Source: Annual reports of pension plans.

EXHIBIT 3

Plan Assets of Largest Canadian and U.S. Public Pension Systems



Canadian dollar values are converted to U.S. dollars as at the end of the fiscal year of each pension plan.
Source: Annual reports of pension plans.

EXHIBIT 4

Comparative Introductory Data: Canada and the U.S.

Row	Variable	Canada	U.S.	Note(s)
a	Population, total (people, million)	37.1	327	1
b	GDP (USD, trillion)	1.7	20.5	2
c	GDP per capita (USD, thousands)	46.2	62.8	3
d	Total fertility rate (births per woman)	1.5	1.7	4
e	Life expectancy at birth (years)	82	78.5	5
f	Working-age population, rate (% of total population)	66.7	65.4	6
g	Labor force, rate (% of working-age population)	78.5	72.6	7
h	Public sector employment, total (people, million)	3.6	22.4	8, 9
i	Public sector employment, rate (% of employed population)	19.3	14.4	10
j	Public pension plans active members, total (people, million)	3.3	14.6	11, 12
k	Public pension plans active members, sample (people, million)	1.5	8.2	13
l	Public pension plans active members, sample (% of total)	46.2	56	k/j
m	Public pension assets, total (USD, trillion)	1.3	3.9	14, 15
n	Public pension assets, total (% of GDP)	58.8	19	m/b
o	Public pension assets, sample (USD, trillion)	0.5	2.5	13
p	Public pension assets, sample (% of total)	48.5	63.8	o/m
q	Number of public pension plans, total (#)	1,242	5,420	11, 12
r	Number of public pension plans, sample (#)	10	25	16
s	Number of public pension plans, sample (% of total)	0.8	0.5	r/q
t	Public pension liabilities, total (USD, trillion)	N/A	9.1	14, 17
u	Public pension liabilities, sample (USD, trillion)	0.4	3.3	13
v	Public pension liabilities, sample (% of total)	N/A	N/A	u/t

All data as of fiscal year end, 2018 unless otherwise specified. Canadian dollar values converted to U.S. dollars as at the end of the respective fiscal year.

Sources:

- 1 OECD. Link: <https://data.oecd.org/chart/5Vve>
- 2 World Bank. Link: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2018&locations=US-CA&start=2018&view=bar>
- 3 World Bank. Link: <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=2018&locations=US-CA&start=2018&view=bar>
- 4 World Bank. Link: <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?amp%3Blocations=CA-US&%3Bstart=2018&%3Bview=bar&end=2018&locations=US-CA&start=2018&view=bar>
- 5 World Bank. Link: <https://data.worldbank.org/indicator/SP.DYN.LE00.IN?amp%3Blocations=CA-US&%3Bstart=2018&%3Bview=bar&end=2018&locations=US-CA&start=2018&view=bar>
- 6 OECD. Link: <https://data.oecd.org/chart/5Vvd>
- 7 World Bank. Link: <https://data.worldbank.org/indicator/SL.TLF.ACTI.ZS?end=2018&locations=US-CA&start=2018&view=bar>
- 8 U.S. Bureau of Labor Statistics. 19.75M State and Local, 2.76M Federal. Link: <https://www.bls.gov/emp/tables/employment-by-major-industry-sector.htm>
- 9 Statistics Canada. Table 10-10-0025-01 Public sector employment, wages and salaries, seasonally unadjusted and adjusted (Last data available March 2012). Link: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1010002501>
- 10 Calculated as: h / total employment (OECD). Link: <https://data.oecd.org/chart/5Vvj>
- 11 United States Census Bureau. Total members of 21.10 million includes 14.57 million active + 6.53 million inactive). Link: <https://www.census.gov/data/tables/2018/econ/aspp/aspp-historical-tables.html>
- 12 Statistics Canada. Table 11-10-0094-01 Registered pension plans (RPPs), active members and market value of assets, by jurisdiction of plan registration. Link: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110009401&pickMembers%5B0%5D=2.2>
- 13 Database. Excludes Canada Pension Plan.
- 14 Federal Reserve Z.1 (Financial Accounts of the United States), Fourth Quarter 2018, Table L.120 (z.1). Link: <https://www.federalreserve.gov/releases/z1/20190307/z1.pdf>, similar data is unavailable in Canada
- 15 Statistics Canada. Table 11-10-0076-01 Trusteed pension funds, value of assets by sector, quarterly (x 1,000,000) (CPP excluded). Link: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110007601&pickMembers%5B0%5D=4.2&pickMembers%5B1%5D=2.1>
- 16 Dataset
- 17 The Federal Reserve measures pension liabilities using a different methodology from that which is used by individual pension systems hence we do not calculate the ratio in row v

3 PENSION REFORM IN CANADA

Canada's macroeconomy of the 1980s and 1990s provides a useful backdrop to understanding pension reforms undertaken at that time. Global commodity markets had led to cyclical pressures on the economy.¹⁵ Rising debt levels at both the federal and provincial levels

laid bare key design flaws in Canada's public pension funds. At the time, they shared several problematic features:

- Plan funding was partially on a pay-as-you-go basis¹⁶ or through superannuation accounts;¹⁷
- Retroactive enhancements to benefit levels were not matched with higher contribution rates;¹⁸
- Contributions were commingled with general government funds rather than funded into segregated accounts;¹⁹
- There was an absence of portfolio management;²⁰
- Plans were encapsulated within statute, so that contribution rates were determined by political processes and required legislative action to amend;²¹ and
- Plans were under the sole sponsorship of government, giving plan beneficiaries no ability to influence plan design or responsibility for ensuring plan solvency.

Over the decade between the late 1980s through the late 1990s, these issues were addressed through a series of reforms. To illustrate, we review reforms in two provinces – Ontario²² and Alberta²³ – and those associated with the Canada Pension Plan.²⁴

While the particulars differ from province to province and between pension plans, certain common features came to epitomize the so-called “Canadian Model.” These include joint sponsorship – which gives labor a seat at the table – and independent, well-governed professionally managed investment organizations to invest pension reserves.²⁵

In each case, a central figure in the federal and provincial political hierarchy, typically the finance minister, supported by an effective technocratic class in the civil service, emerged to understand and take ownership of the problem, articulate an end-goal, and oversee engagement with stakeholders to implement difficult changes.

Observers of the Canadian public pension system point to good governance as a defining feature.²⁶ In evaluating governance models, it is helpful to have a framework. Bartholomew et al., 2018 provide one, which distinguishes between:

- Principals – plan members (active and annuitant), taxpayers,²⁷ municipal bondholders, and users of government services – these parties bear the costs associated with pensions;
- Agents – trustees, government officials, and union representatives; and
- Agents of agents – actuaries, fund managers, lawyers, and consultants.

Optimal governance prioritizes the interests of principals over those of both agents and agents-of-agents. It is the principals who should determine plan features and play a central role in plan governance. A new governance model was established in Canada, framed on joint sponsorship and governance, independence from government, uniformity in legislation and regulation, and minimum standards of professionalism on pension boards.

3.1 The Canada Pension Plan

The Canada Pension Plan provides basic retirement income to all Canadians.²⁸ It was established in 1966²⁹ as a pay-as-you-go system funded with equal contributions from employers and plan participants.³⁰ CPP's original model set total contribution rates at 3.6%, just enough to pay each year's benefits along with a small reserve fund to cover approximately two years of benefits.³¹ Excess funds were lent to the provinces.³²

Pension benefits – but not pension contributions – were fully indexed to inflation, which had accelerated during the 1970s, leading to a growing realization that the contribution rate would be insufficient to ensure ongoing plan solvency. Between 1970 and 1995, CPP's chief actuaries grew increasingly concerned about long-term intergenerational inequity associated with abrupt increases in contribution rates.³³

The actuaries pointed to a series of “critical points.” The first was the year in which contributions would be insufficient to fund current benefits. The second was the year in which accumulated interest would be fully consumed by benefits. And the third was the year in which the plan's entire principal would be depleted.³⁴ They recommended an increase in contribution rates at each critical point, to ensure plan solvency.

In 1983, contributions decreased for the first time,³⁵ while demographic changes were becoming a concern.³⁶ Contribution rates were increased in 1987 and again in 1991.³⁷ Even so, the chief actuary's 1993 report projected that CPP would run dry by 2003.³⁸

The CPP debate had entered the public sphere and “like most good contests in the marketplace of ideas and public policy... [it] involved assembling a factual foundation, analyzing the strength and weaknesses of the CPP, promulgating long-held views, developing new solutions, and indulging in no little amount of myth busting.”³⁹ So the government⁴⁰ began a review of CPP, including the idea of a much larger investment fund.⁴¹ There was ample evidence by that time of the efficacy of large professionally-managed investment pools.⁴²

In early 1996, the federal and provincial finance ministers prepared a paper⁴³ to frame public consultations on the future of CPP.⁴⁴ A total of thirty-five consultative sessions were held throughout Canada between April and June 1996.⁴⁵

The summary report from the public hearings showed near unanimous support for “a better investment strategy for the CPP fund... managed at arm's length from government under a fiduciary mandate.”⁴⁶ This report formed the basis for legislation that was enacted into law on December 18, 1997.⁴⁷ CPP would continue as a PAYGO system, contribution rates would be increased to 9.9% allowing a large reserve pool to accumulate, and the manager of this reserve pool, Canada Pension Plan Investment Board, would come into being. Today, more than two decades later, the chief actuary continues to affirm that the contribution levels of the Canada Pension Plan are sustainable for the long term.⁴⁸

3.2 Ontario

Ontario⁴⁹ pension reform was undertaken between the late 1980s and early 1990s. The status quo ante was that pension contributions were not segregated, but rather deposited in general government accounts. Reserves were not invested in financial markets, but rather in non-marketable Ontario debentures.⁵⁰

The Ontario government owned and controlled the province's pension funds with little involvement in governance by plan beneficiaries. Benefits were retroactively indexed to inflation, resulting in large increases during the inflationary 1970s and 1980s. Contributions were not increased. To make matters worse, the province's most important pension systems were maturing.⁵¹

Given growing concerns about the solvency of Ontario's pension plans, the newly-appointed Minister of Finance in 1985⁵² initiated a series of commissions⁵³ to solicit expert opinions and identify the best road forward. Reform ensued, addressing each of the plans' structural flaws:

- Taking pension funds off the provincial government's balance sheet and isolating them into segregated accounts;
- Authorizing these accounts to invest in markets;
- Restructuring the plans under joint sponsorship of the respective employer and employee union – with joint trusteeship and governance;⁵⁴
- Reforming plan design by increasing contribution rates to ensure long-term solvency;⁵⁵
- Removing pensions from statute so that terms could be determined directly between employers and unions;⁵⁶ and
- Establishing independent investment organizations to administer the pension plans and invest their assets.

Ontario Teachers' Pension Plan (OTPP), the OPSEU Pension Trust (OPTrust), and the Ontario Pension Board (OPB)⁵⁷ were created as a result of these reforms.⁵⁸ The government calculated the accumulated pension gap and agreed to fund it over a 40-year period.⁵⁹ Ontario's other large pension fund, Healthcare of Ontario Pension Plan (HOOPP), was restructured in 1993 under a joint-sponsorship model between the Ontario Hospital Association (OHA) and four healthcare-sector unions.⁶⁰

Reforms were encapsulated in legislation. The Ontario Pension Benefits Act of 1965 (as amended) provides the overarching framework for pension governance in the province. Each of Ontario's four largest pension plans was subsequently restructured under joint sponsorship between the provincial government and the union representing its members, while partnership agreements were established to codify the roles and responsibilities of the respective parties.

3.3 Alberta

Plan design challenges in Alberta were similar to those in Ontario.⁶¹ Reform followed a similar if not quite identical path.⁶² The province's economy is very sensitive to oil prices, from which it benefited significantly during the 1970s.⁶³ New tax rules,⁶⁴ pressures from petroleum price declines in the late 1980s and early 1990s, and the cumulative effect of consistent awards of cost-of-living-adjustments without concomitant increases in contributions all served as catalysts for reform.

As in Ontario, pension reform required strong leadership. Two successive provincial treasurers⁶⁵ undertook a series of changes to ensure long-term solvency of the province's public pension plans beginning in 1986.

Plan accounting was addressed,⁶⁶ segregated accounts were set up for each pension group,⁶⁷ and a centralized investment office was set up in the Alberta Treasury and authorized to invest reserves.⁶⁸ Cost of living adjustments were reduced⁶⁹ and contribution levels were set to increase gradually. Arguably the most important factor was that the Alberta public pension plans were restructured under joint sponsorship.

Unlike in Ontario, where the government covered the full unfunded pension liability, Alberta in 1992 extinguished unfunded liabilities with the burden shared between the government and increased contributions from employers and employees.⁷⁰

Important legislation was passed in the form of the Public Sector Pension Plans Act of 1993. Much later, the Employment Pension Plans Act of 2012 created uniform prudential standards for public and private sector plans in Alberta.⁷¹ In addition, the Joint Governance of Public Sector Pension Plans Act of 2018 was put in place to formalize governance of the province's public sector pension plans.

Exhibit 5 summarizes key pension reforms undertaken in Canada. The examples of the CPP, Ontario, and Alberta identify the fingerprints of the Canadian pension reform process. First is the recognition of the lack of sustainability of the preexisting system. Second is pension plan restructuring that encompasses contributions, benefits, legacy burden sharing, detachment from government, and professionalism in fund governance and investment management going forward. Since the key reforms in all three sample cases were not painless, committed leadership and the willingness of key individuals to put political capital on the line was critical.

EXHIBIT 5

Pension Reform Undertaken in Canada During the 1980s and 1990s

Feature	Pre-reform	Reform
Plan design	Terms adjusted on an ad hoc basis (retroactive indexation)	Holistic determination of all plan design terms
Asset segregation	Contributions commingled with other government funds	Pension assets moved into segregated accounts
Investing scope	Where invested (outside of superannuation accounts), contributions lent to provinces in non-marketable debentures	Authorized to invest in all markets (bonds, equities, private markets)
Plan sponsorship	Plans under sole sponsorship of government, members had no influence on governance or responsibility for solvency	Members took a seat at the table alongside government, thereby able to influence plan design, but with shared responsibility for plan funding
Legal structure	Plans encapsulated within statute, making amendments cumbersome	Plans converted to contractual status so terms can be negotiated between parties
Investment organizations	Where investing occurred, it was undertaken from within government departments	Independently governed investment organizations established, ultimately developing direct investing capabilities
Amortization of unfunded liabilities	Insufficient accounting to determine full degree of pension funding	Assets and liabilities independently calculated, funding gaps amortized (burden of amortization shared between sponsors and plan members to different degree depending on province and pension system)
Legislation	Prudential and governance standards not legislated	Provincial legislation enacted to ensure common standards for all pension plans in each province (public and private sector)

This exhibit seeks to reflect a synthesis of reforms across the country. In so doing, some nuance is lost since the changes in each province and pension system were not uniform, nor were they necessarily undertaken in a predetermined way.

4 CANADA – U.S. PAIRED ANALYSIS

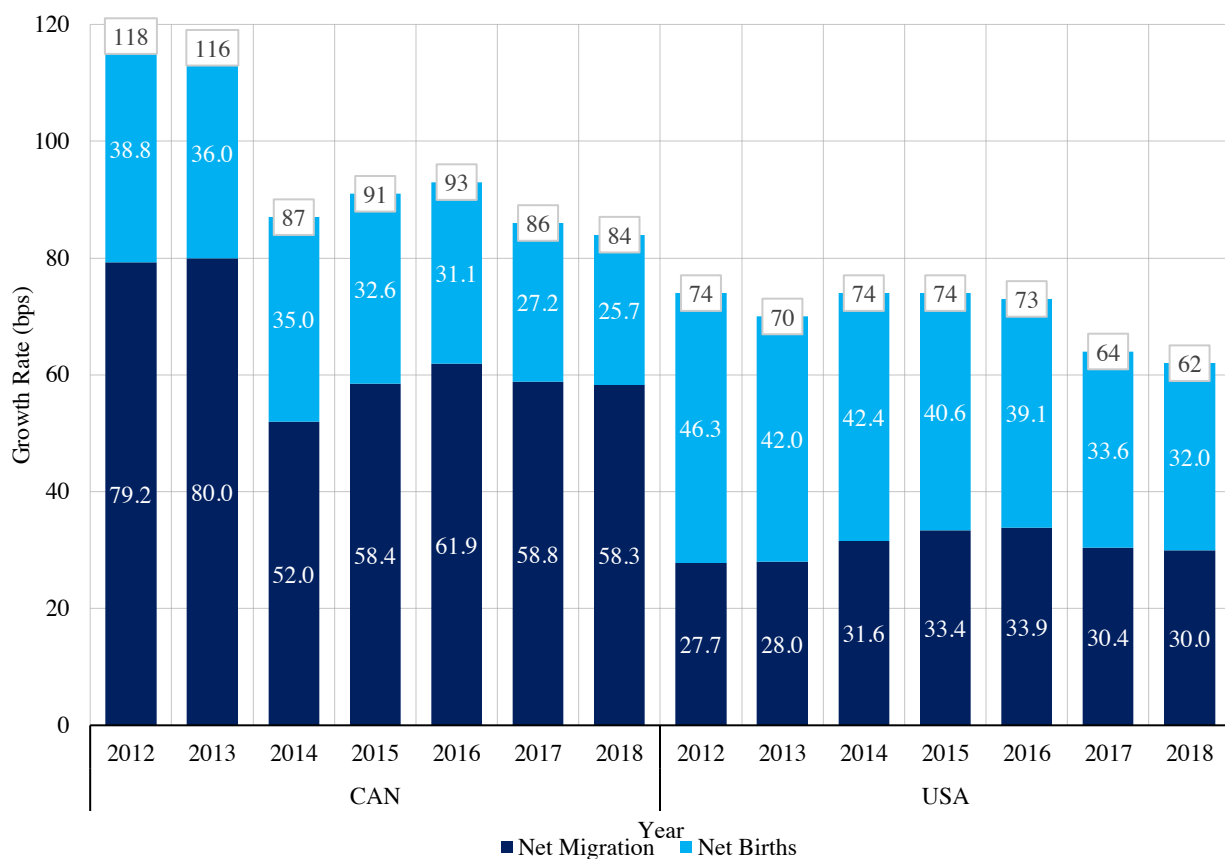
We turn now to a comparative analysis of the largest pension plans in Canada and the U.S. through the lens of our primary dataset.

4.1 Demographics

An important factor driving pension dynamics is demography. Specifically, the comparative rate of change in the number of active pension fund members, and that of retirees or annuitants. The number of active members determines contributions or inflows, while the number of annuitants is what determines benefit payments, or outflows. In turn, these are driven by factors such as immigration trends, fertility rates, life expectancy, and public sector employment levels.

Over the past twenty years, Canada has experienced consistently higher population growth than the U.S., primarily due to higher rates of net migration. Net births in the U.S. have exceeded those in Canada, see Exhibit 6. Relative to the U.S., Canada has an aging population with higher life expectancy and lower fertility rates.⁷²

EXHIBIT 6
Population Growth Rate (2012-2018)

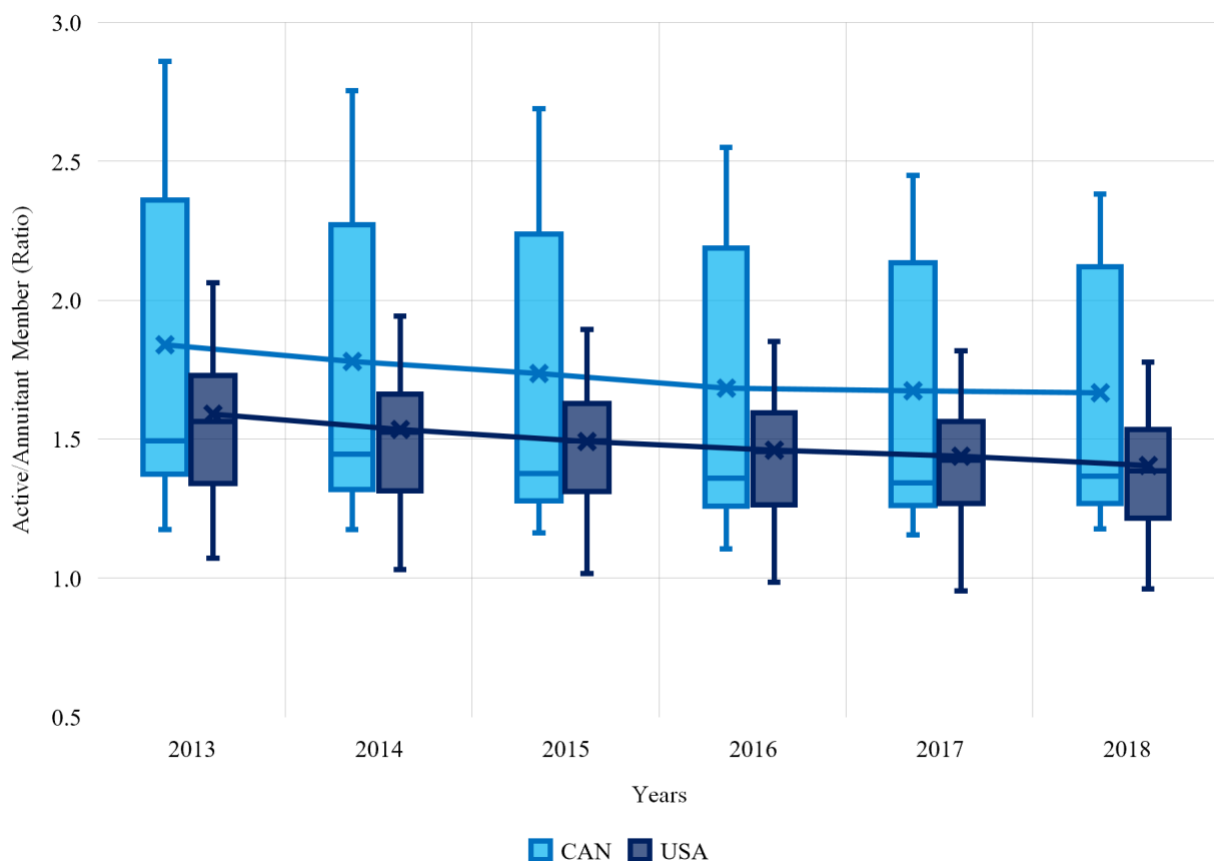


Births, deaths, and net number of migrants are approximated based on mid-year population data. Growth rate may not equal the sum of the rate of natural increase and the migration rate due to rounding.
Source: U.S. Census Bureau.

Exhibit 7 illustrates trends in the active-to-annuitant ratio in public employee pension plans in the two countries during the period 2013 to 2018. The ratio in the U.S. declined from 1.59 in 2013 to 1.40 in 2018. In Canada it declined from 1.84 to 1.67 over that period.⁷³

EXHIBIT 7

Trend in Active-to-Annuitant Ratio



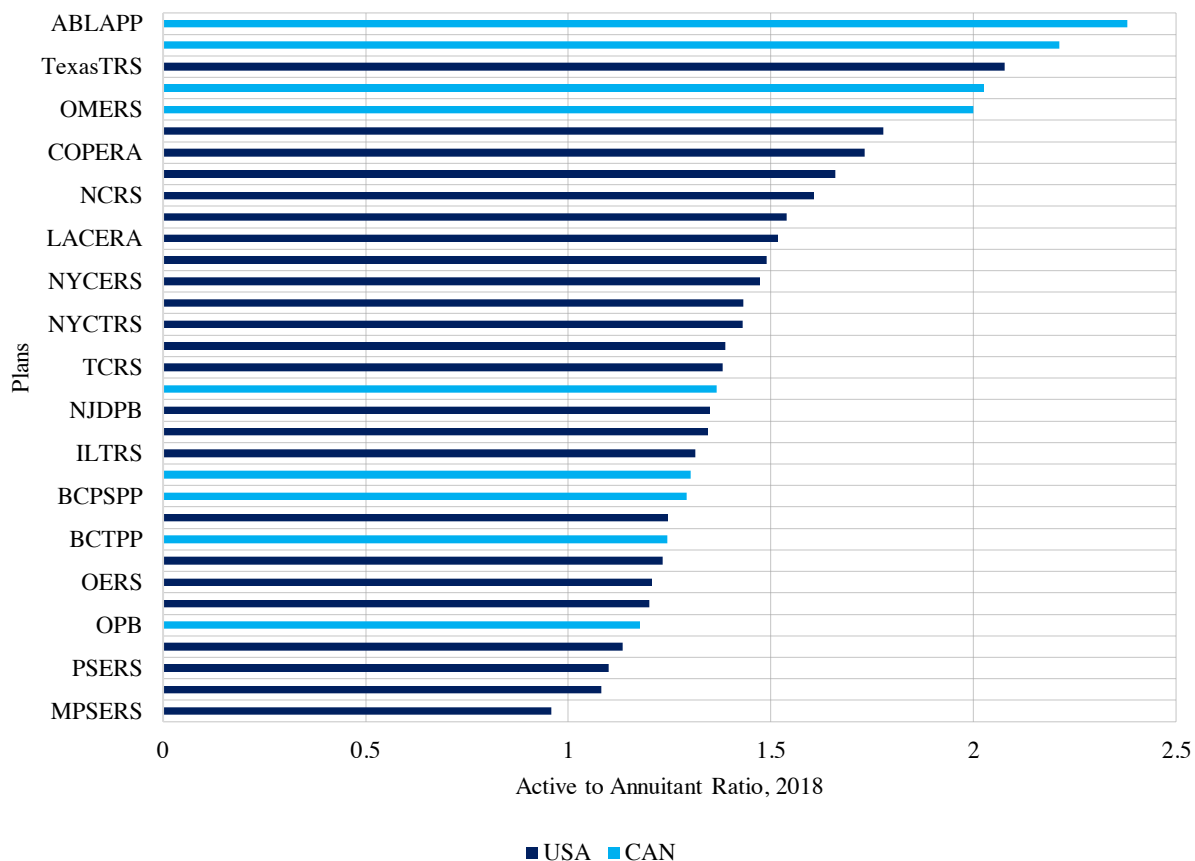
Data for all 35 pension plans in the dataset except for Canada Pension Plan and Washington Department of Retirement Systems.

Source: Annual reports of pension plans.

These trends did not occur in a monolithic way. Rather, they vary across geography and by profession. For example, Alberta and Texas each benefited from population growth over the past decade, influenced in no small part by the hydrocarbon economy. So it is unsurprising that the active-to-annuitant ratio for pension plans in these political units is the highest in their respective countries, see Exhibit 8.

EXHIBIT 8

Active-to-Annuitant Ratio by Pension Plan



Source: Annual reports of pension plans.

The effect of profession is well illustrated by different pension plans in Ontario. The teachers', municipal workers, and healthcare plans experienced different maturation trends associated with the baby boomer generation. The number of teachers grew significantly while this generation was in its childhood years, peaking in the 1970s, as reflected in the demographics of OTPP. As that population segment entered adulthood and family formation, it led to an increase in the number of municipal workers – explaining the demographics of OMERS. Finally, as the generation entered retirement, it led to what will be a sustained increase in healthcare employment – explaining the demographics of HOOPP.⁷⁴

4.2 Plan Design

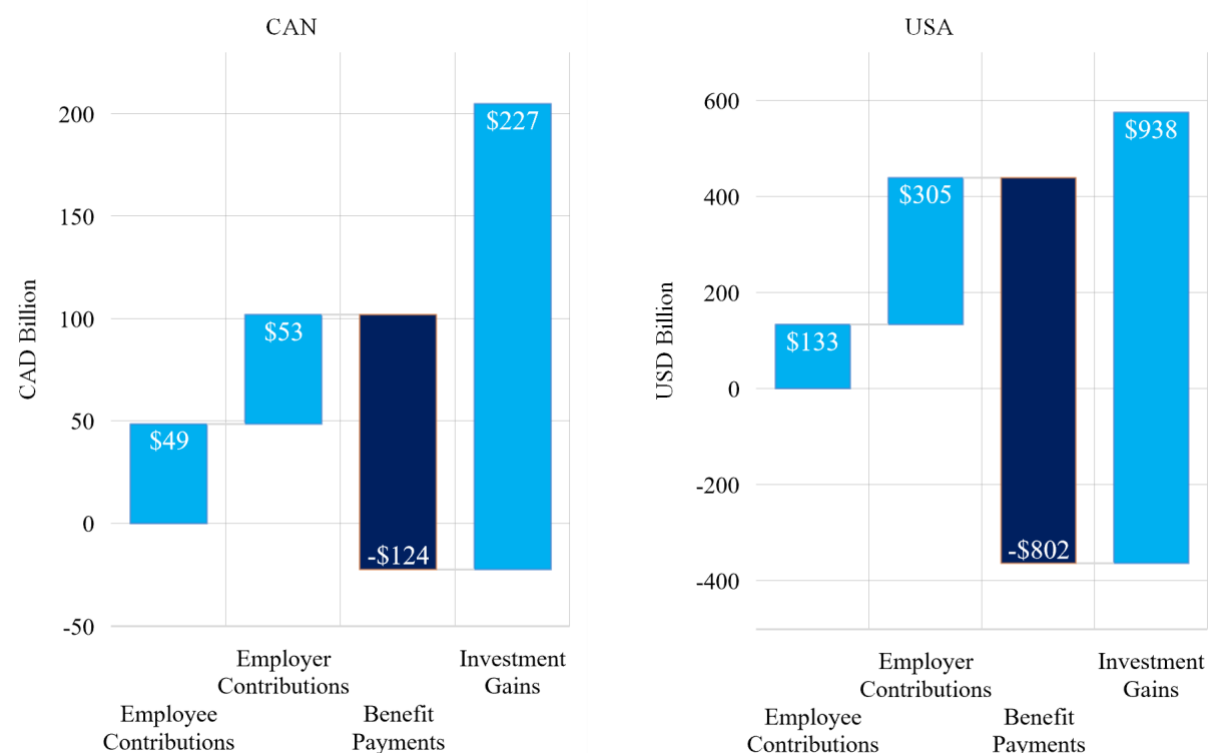
Pension plan design focuses principally on benefit levels and how they are funded. Under the governance system in Canada, these are evaluated and determined holistically by the pension board, which goes a long way to ensuring plan solvency. In the U.S., by contrast, benefits and contributions are usually determined separately – one often within statute, the other as part of collective bargaining agreements. Frandsen and Webb, 2017 find that collective bargaining results

in increased government contributions, reduced plan member contributions and higher benefit levels

Exhibit 9 shows cumulative source and use of funds for the plans in our sample in each of the two countries over the five-year period ending 2018. In the aggregate, contributions accounted for 31.8% of total funding in the U.S., compared with 30.9% in Canada, with investment performance responsible for the difference. While total funding in the two countries was equally sensitive to investment performance, the composition of contributions is significantly different. The ratio of employer-to-employee contributions is 1.1x in Canada, while it is 2.3x in the U.S. In other words, in the U.S., employees bear considerably less of the funding burden than do employers, while the burden is shared approximately equally in Canada.⁷⁵

EXHIBIT 9

Changes in Fiduciary Net Position (Cumulative 2014-2018)

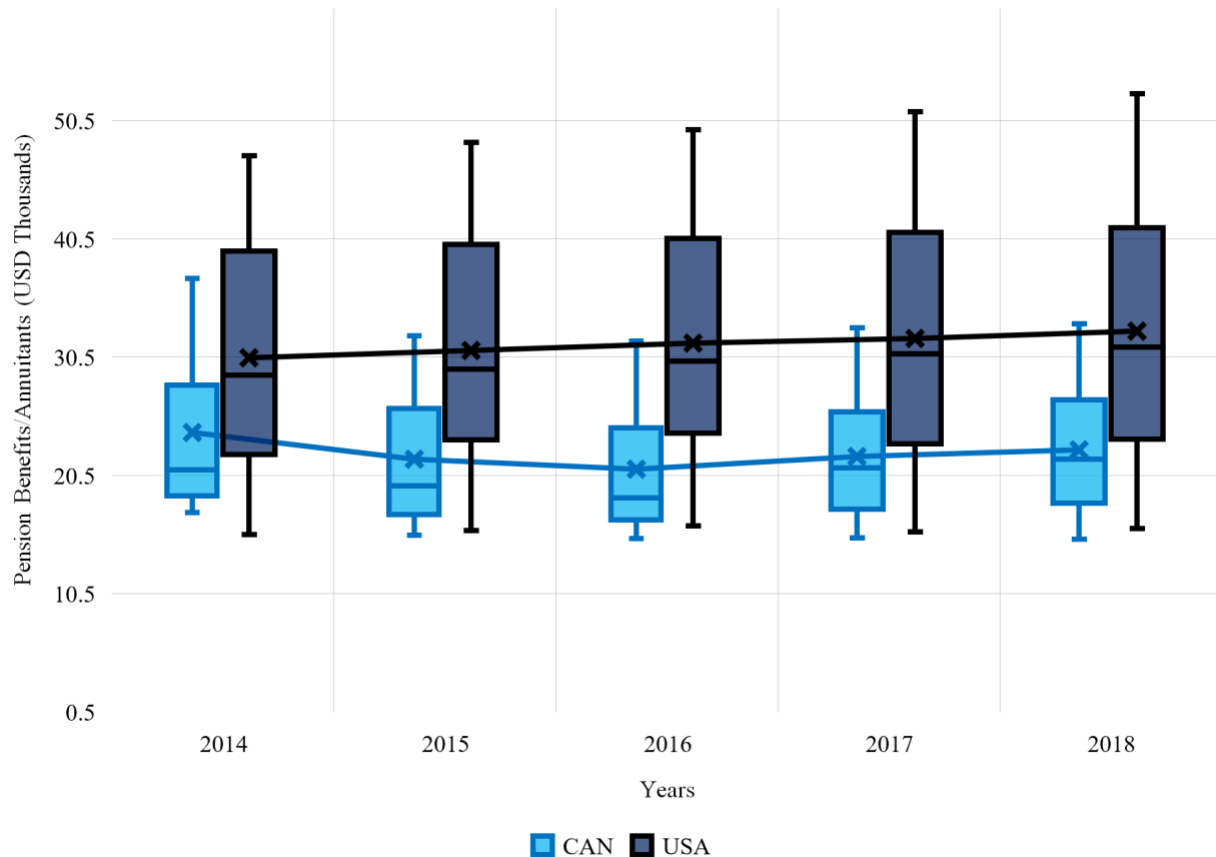


Data for all 35 pension plans in the dataset except for Canada Pension Plan.
Source: Annual reports of pension plans.

An important point that is often missed, according to Bartholomew, et al., 2018, is that the “cost” of pensions is the benefits promised. Contributions are simply a down payment on that cost.⁷⁶ Contributions cover 81.8% of benefits in Canada, but only 54.6% of benefits in the U.S. Clearly pension plan design is geared more towards full funding in Canada than it is in the United States and pension solvency in the U.S. is thus much more dependent on investment performance than is the case in Canada.

Plan Benefits and Risk Sharing: Exhibit 10 compares benefits per annuitant in Canada and the U.S. over the five years ending 2018. U.S. pensions are more costly than are those in Canada.⁷⁷

EXHIBIT 10
Pension Benefits/Annuitant



Canadian dollars converted at the average exchange rate for each year.
Source: Annual reports of pension plans.

An important consideration is the degree to which benefits might be amended if plan solvency would otherwise be imperiled. This is often referred to as “shared risk.” Consider a continuum between sacrosanct benefits on one end and shared risk on the other. The U.S. is at one extreme,⁷⁸ the Netherlands at the other, and the Canadian pension system somewhere in between.⁷⁹

In Canada, pension benefits are conditional on funded status.⁸⁰ In the U.S., there is very limited ability to restructure – on a prospective basis – previously negotiated benefits, which have very strong protection in constitutional or statutory provisions and court precedent.⁸¹

Contributions: In Canada, pension contributions are usually determined by the pension board. For plans with a bicameral governance model, the sponsor board determines contributions. In the U.S. contributions are much more difficult to adjust and may even be delineated in the respective state constitution. As illustrated earlier, contributions are typically equal for employer

and employee in Canada⁸² – see Exhibit 11 for an illustration. In the U.S., the funding burden is twice as large for employers as it is for plan members.⁸³

EXHIBIT 11

Contribution Rates in Canada (Employers and Plan Members, 2018)

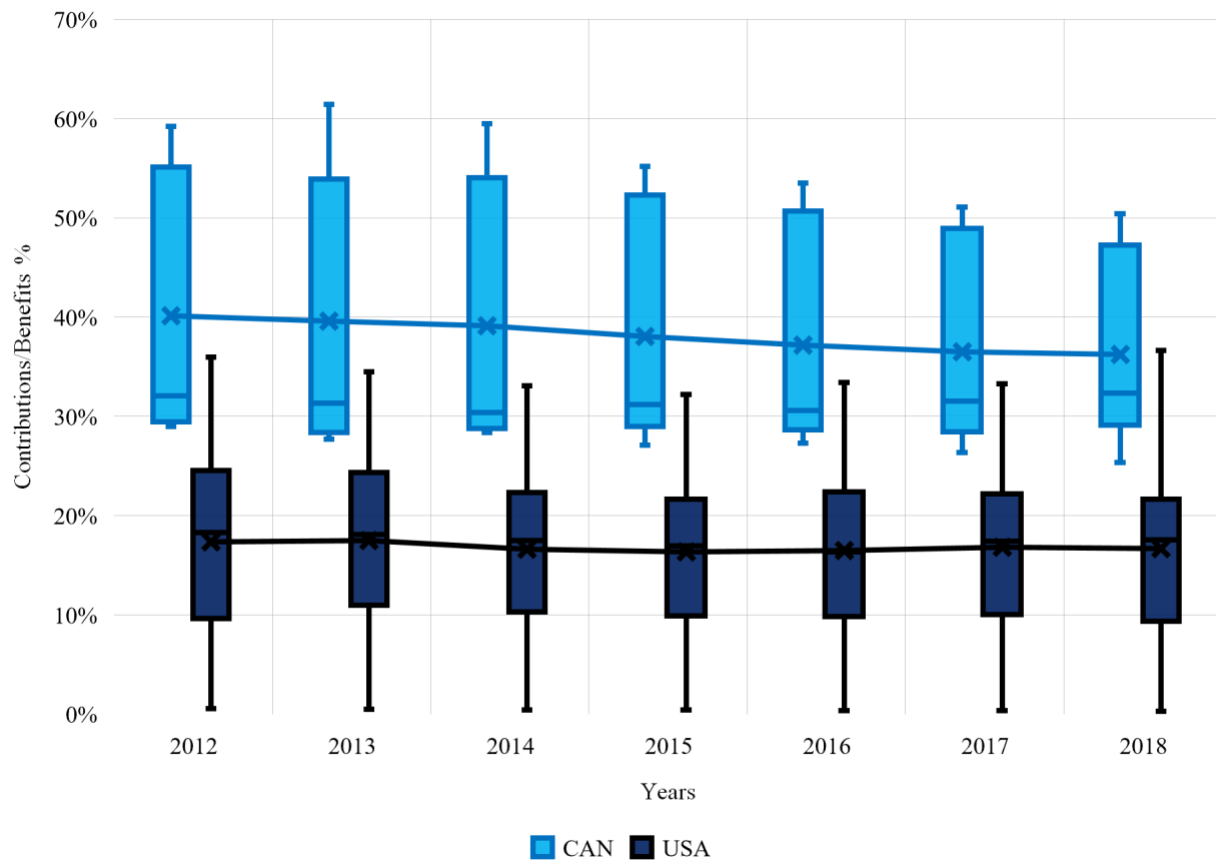
	Wages > YMPE		Wages < YMPE	
	Employer	Member	Employer	Member
ABLAPP	14.84%	13.84%	10.39%	9.39%
BCMPP	N/A	10.00%	N/A	8.50%
BCPSPP	10.93%	9.43%	9.43%	7.93%
BCTPP	14.31%	14.00%	12.81%	12.50%
CPP	N/A	N/A	4.95%	4.95%
HOOPP	9.20%	9.20%	6.90%	6.90%
OMERS	14.60%	14.60%	9.00%	9.00%
OPB	10.05%	10.05%	6.90%	6.90%
OTPP	13.10%	13.10%	11.50%	11.50%
PSP	11.30%	11.30%	9.30%	9.30%

YMPE = Year's Maximum Pensionable Earnings.

Source: Annual reports of pension plans.

Exhibit 12 illustrates the wide disparity between the burden of funding on plan members in the two countries, while Exhibit 13 illustrates that the funding from employer contributions has converged over time.⁸⁴ Evident from these charts is not that Canadian employers are sharing a greater funding burden than are their U.S. counterparts, but rather that plan members in the U.S. are getting a much better deal.

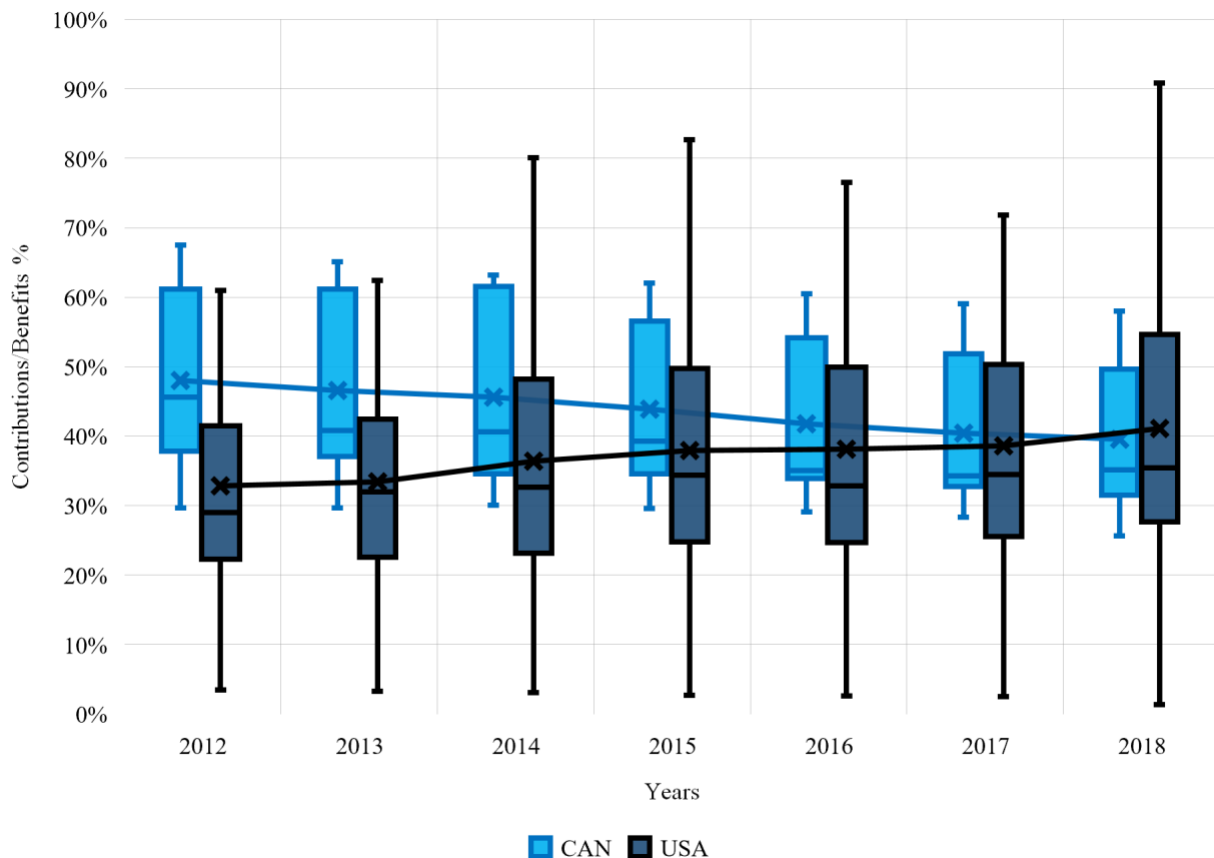
EXHIBIT 12
Ratio of Member Contributions to Benefits



Data for all 35 pension plans in the dataset except for Canada Pension Plan. Since Alberta Local Authorities Pension Plan is an outlier, it was excluded from the chart.
Source: Annual reports of pension plans.

EXHIBIT 13

Ratio of Employer Contributions to Benefits



Data for all 35 pension plans in the dataset except for Canada Pension Plan. Since Alberta Local Authorities Pension Plan is an outlier, it was excluded from the chart.

Source: Annual reports of pension plans.

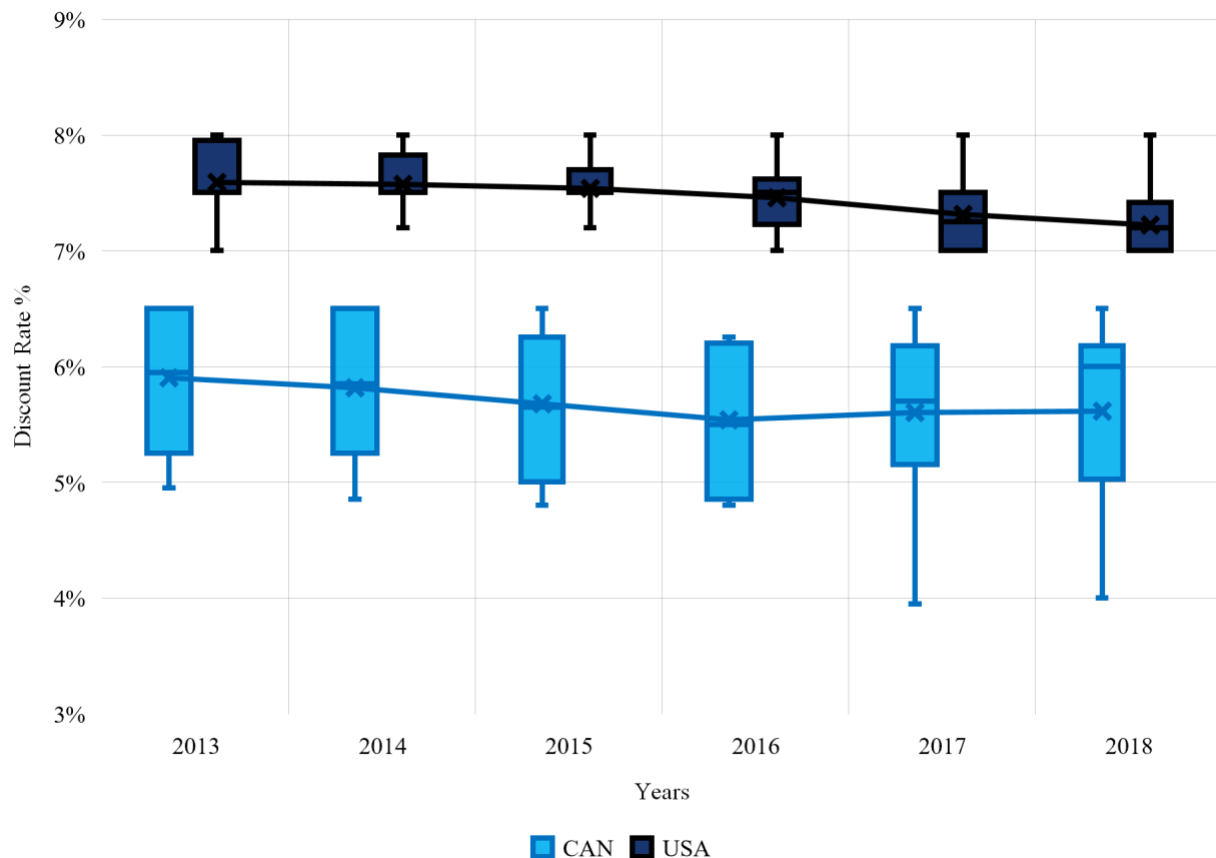
4.3 Discount Rates

Perhaps the most important parameter in pension finance is the rate by which pension liabilities are discounted to present value. Public pension accounting rules in Canada permit pension plans to use government bond rates or the expected rate of return on the investment portfolio as the discount rate, most sponsors choose the latter. In the U.S., discount rates are generally set equal to the expected rate of return.⁸⁵ The expected rate of return is calculated using an assumption for the risk-free rate; the sum of products of the allocation to, and expected risk premium of each asset class; and an inflation estimate.⁸⁶

There are substantial differences in discount rates between the two countries. Exhibit 14 shows that public pension fund discount rates in the U.S. significantly exceed those in Canada. In 2018, the average discount rate for U.S. plans was 7.22%, while for Canadian plans it was 5.61%. This relative confidence in investment returns on the part of U.S. plans is not supported by the evidence. Canadian plans have outperformed their U.S. peers in prior periods, see Exhibit 22.⁸⁷

EXHIBIT 14

Discount Rate Distribution

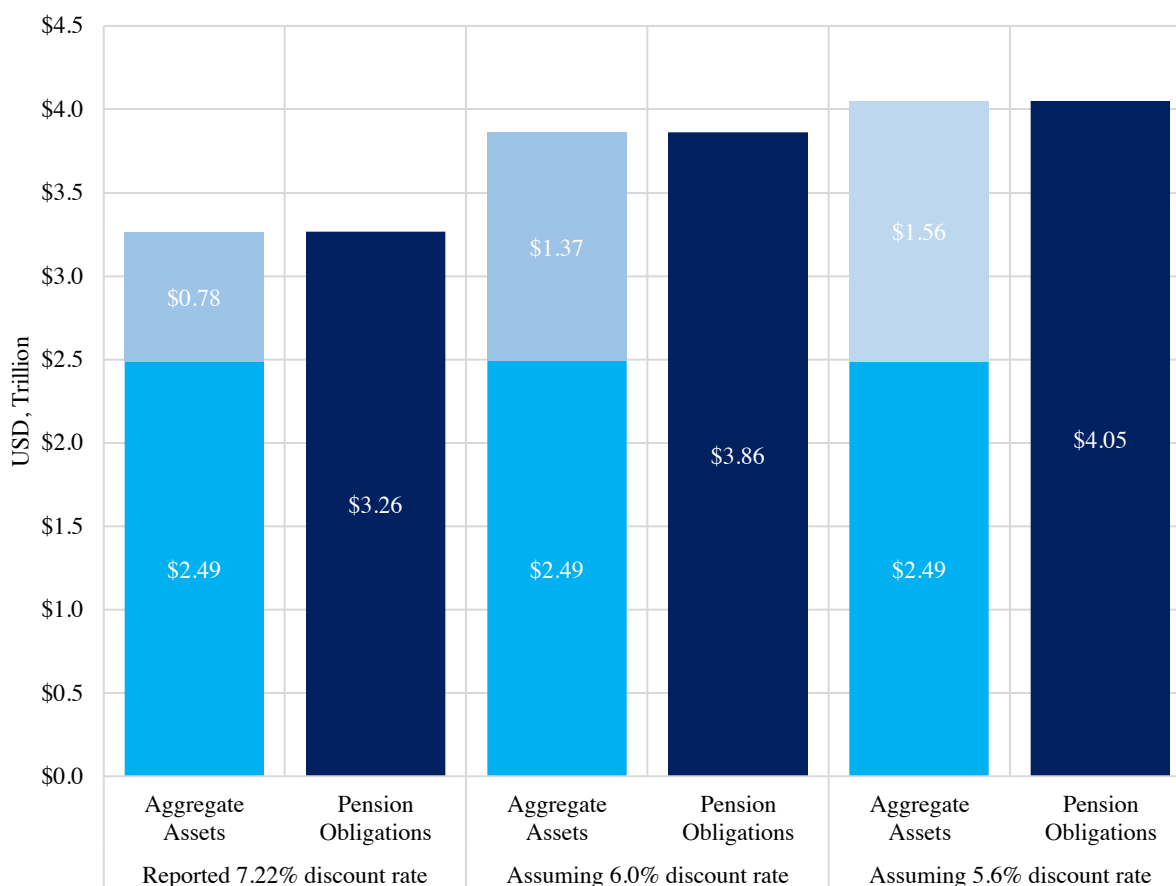


Data for 2017 and 2018 for all 35 pension plans in the dataset except for Canada Pension Plan. Data for 2013 through 2016 excludes BCTPP and BCPSP. Source: Annual reports of pension plans.

If U.S. plans are using discount rates that are too high, then they are under-estimating liabilities and over-estimating funded status.⁸⁸ Consider the impact of reducing the discount rate for U.S. plans from the reported 2018 average of 7.22% to 6% or even to the Canadian average of approximately 5.61%.⁸⁹ Exhibit 15 shows that under this assumption the funding gap for our U.S. sample would balloon from \$0.8 trillion to \$1.37 trillion and \$1.56 trillion, respectively.

EXHIBIT 15

Aggregate Assets under Management vs. Pension Obligations



Data for all 35 pension plans in the dataset except for Canada Pension Plan.

Source: Annual reports of pension plans.

The variance in discount rates between the two countries can be explained by understanding the role of boards, investment consultants, and actuaries in determination of this key input.

In Canada, actuaries affirmatively recommend discount rates based on best estimates of future returns.⁹⁰ Plan sponsors, guided by regulators, are cautious in valuing liabilities, evidenced by discount rates that are often well below historical investment performance.⁹¹ The role of external investment consultants in the process is limited.⁹²

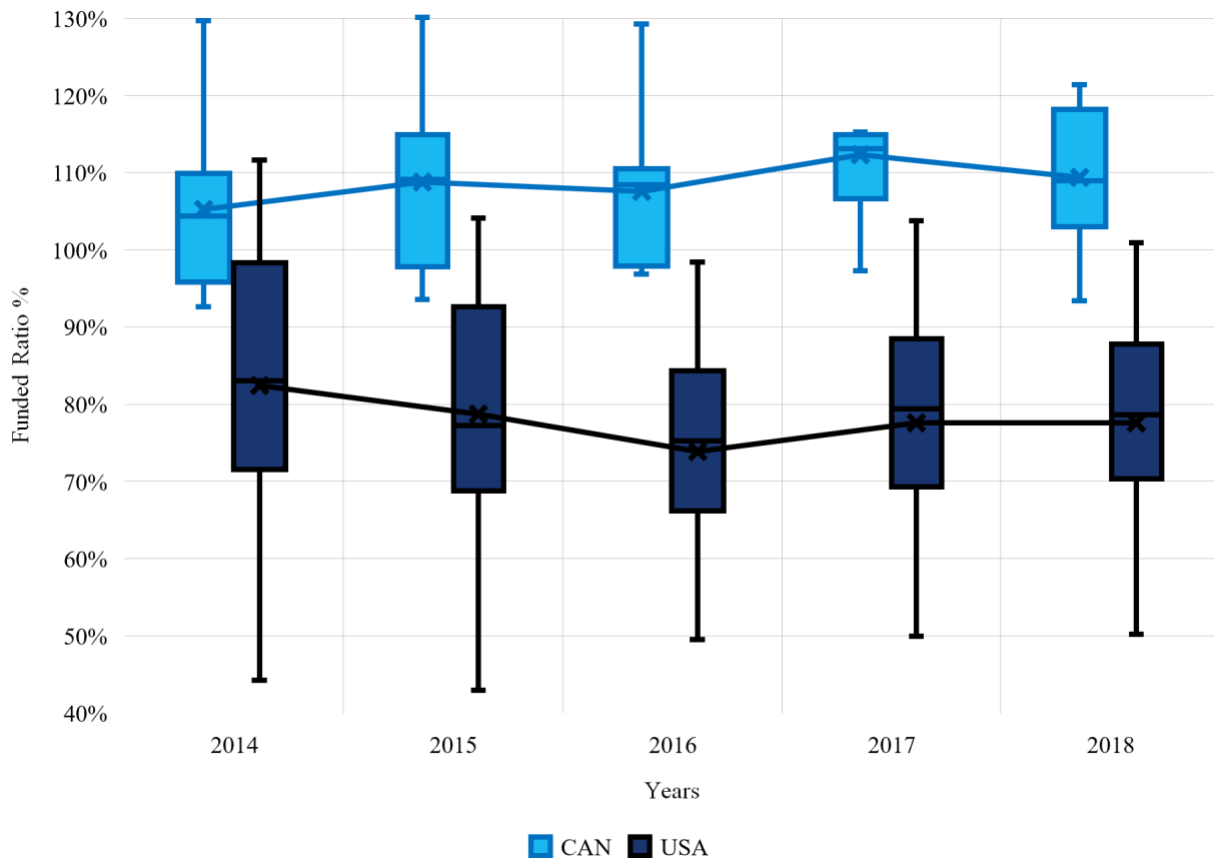
In the U.S., by contrast, pension boards are widely guided by investment consultants. The role of independent actuaries is to opine on the reasonableness of the discount rate,⁹³ a lower threshold than that in Canada. American pension regulation is much more diffuse, with less consistent pressure to operate conservatively. Finally, there is occasional pressure from the executive and legislative branches of the sponsoring jurisdiction, since lower discount rates would trigger the need for increased pension contributions, something that may not be economically or politically tenable considering the state of public finances in many U.S. jurisdictions.

4.4 Funded Status

The Canadian pension plans in our sample report an average funded status of more than 100%, while the U.S. plans report an average funded status of 77.6% - see Exhibit 16 for funding ratios since 2014. These funding ratios are based on self-reported liabilities, which in turn are based on discount rates over which pension funds have substantial discretion.

EXHIBIT 16

Reported Funded Ratio (2014-2018)



Data for all 35 pension plans in the dataset except for Canada Pension Plan
Source: Annual reports of pension plans

4.5 Investment Organization

The genesis of the Canadian Model of pension investment organization can be traced to the spinout of OTPP⁹⁴ from the Ontario government in 1990, discussed earlier.⁹⁵ Its founding leadership won board support⁹⁶ to operate the pension fund “like a business.”⁹⁷

When the U.S. took over the Panama Canal concession, the first plan of action was not to “make the dirt fly” – as President Theodore Roosevelt might have preferred – but rather to eradicate the scourge of yellow fever that had stymied the French. In a similar way, the initial action at OTPP was not focused on investments, but on fixing more mundane issues like plan administration and client service.

Next came changes in asset allocation. At the time of OTPP's restructuring, its portfolio was invested entirely in non-marketable, non-tradable and non-negotiable debentures of the province of Ontario.⁹⁸ It received authorization to invest more broadly in financial markets⁹⁹ and by the end of 1991 OTPP was firmly established as one of Canada's largest equity investors. Over time, it expanded into private equity, venture capital, real estate, and infrastructure investing.

The investing model that emerged as OTPP evolved organizationally was imitated by other Canadian pension plans.¹⁰⁰ Today this model is ubiquitous in Canada. While U.S. pension plans have sought to emulate this model, they are constrained by governance, funding, and compensation norms, among other factors.

Private Market and Direct Investing: A distinguishing feature of the Canadian Model is an orientation to private market investing, specifically in real assets. This has been accomplished through organic expansion into new asset classes¹⁰¹ and by acquiring – sometimes in stages – specialist capabilities.¹⁰² HOOPP is a standout among the large Canadian pension organizations in that it has much less exposure to private markets.¹⁰³

OTPP oriented itself nearly from the start to direct investing in the real sector of the economy as opposed to investing through funds advised by external managers. This was justified by a belief that doing so would generate portfolios and cash flows more directly aligned with pension liabilities and benefit payment obligations, and that it would be cheaper over the long term, particularly in the case of private market investing. At the same time, direct investing requires a large and sophisticated team remunerated at market-level compensation.¹⁰⁴ All of these considerations were weighed by OTPP's board, and alignment was sought by means of long-term incentive compensation schemes.¹⁰⁵

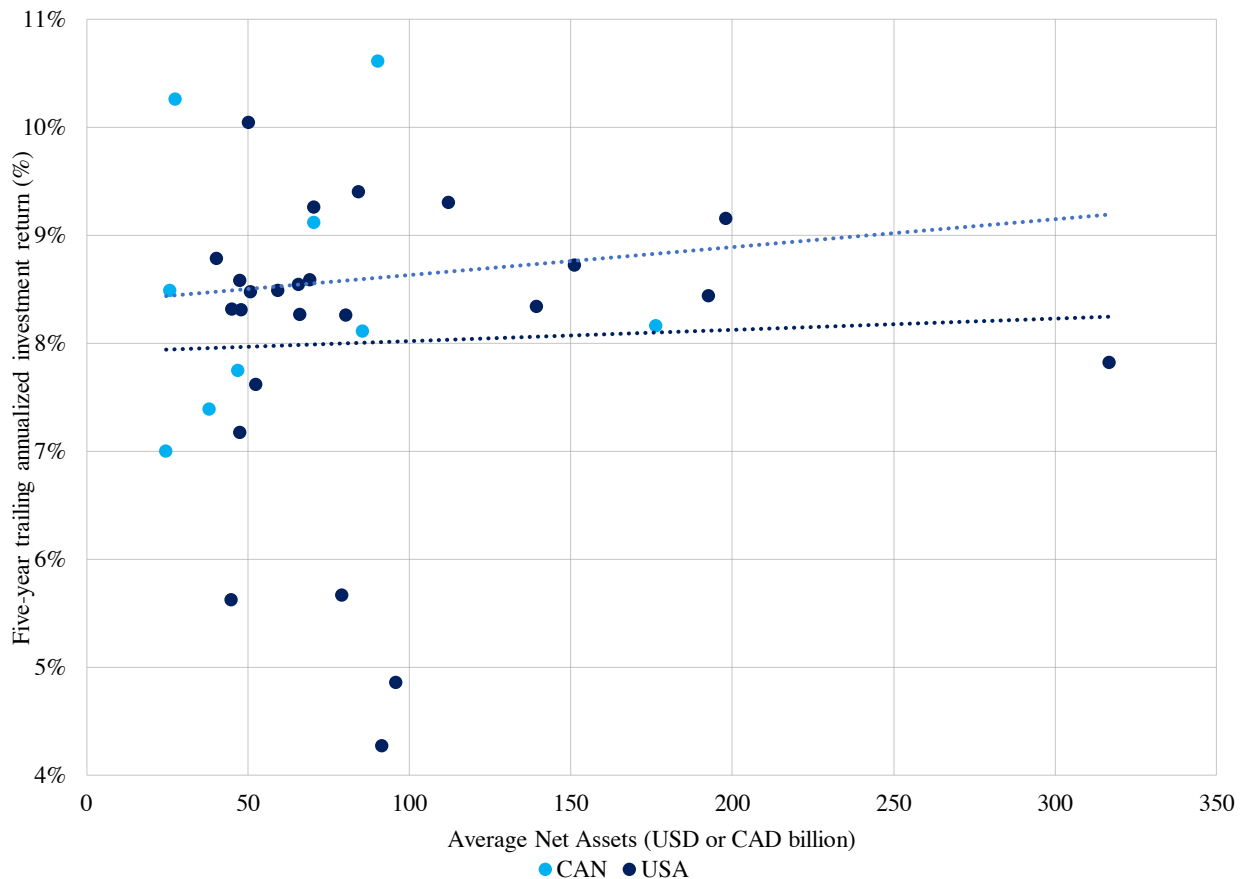
While some U.S. public pension funds invest much of their equity and fixed income portfolios internally, most invest their private market allocations primarily through external fund managers. A few have developed the capability to undertake co-investments, and the very largest among them have established separately managed accounts in private market strategies. Many have been influenced in part by the experience of David Swensen, long-time chief investment officer at Yale University, and seek to invest in what are perceived to be top-performing funds in order to generate superior total returns.¹⁰⁶

Size Effects: The impact of scale in pension fund management is not well explored, with empirical observations that are inconclusive so far. There are two questions to ask in this context. First, do larger pension plans achieve superior gross investment returns because they can adopt more sophisticated investment models? Second, do larger pension plans operate more efficiently than smaller ones?¹⁰⁷

Little quantitative evidence is available so far to evaluate whether large pension plans outperform small ones.¹⁰⁸ The investing capabilities of the larger Canadian pension plans rival those of the most sophisticated private-sector investment management firms.¹⁰⁹ So there is some benefit to size. At the same time, these benefits – should they exist – are likely to dissipate above a certain threshold.¹¹⁰ Exhibit 17 illustrates no evidence of a correlation between pension plan size and investment performance net of fees for the U.S. dataset and very weak evidence of such correlation for the Canadian dataset.

EXHIBIT 17

Net Investment Performance to Net Assets



Trailing annualized investment performance and average plan assets over five-year period ending 2018. Data for all 35 pension plans in the dataset except for Canada Pension Plan.
Source: Annual reports of pension plans.

Efficiency in operations can be measured by expense ratios.¹¹¹ Pension plans incur two types of expenses – administrative and investment-related. The former relates primarily to the cost of plan member services, which are typically measured on a per-member basis.¹¹² We are more concerned here with investment expenses. These include the cost of the internal investing team as well as fees and other charges levied on capital allocated to external investment managers. If two pension plans have similar investment strategies, the larger should exhibit a lower expense ratio, since it can amortize fixed costs over a larger base of assets and negotiate better fees with external managers.¹¹³ This is certainly true with respect to private market investing.¹¹⁴

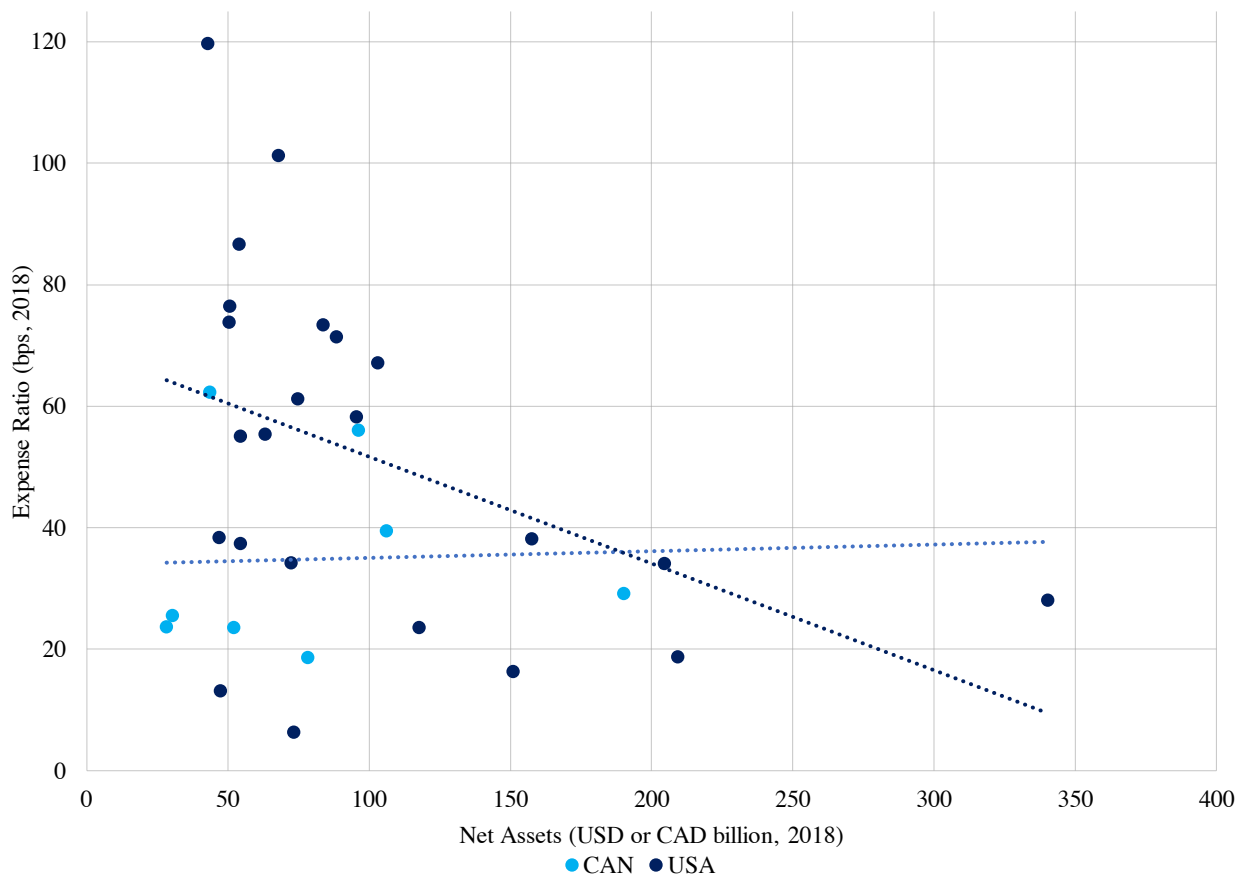
It is difficult to evaluate size-effects among public pension funds in a systematic way.¹¹⁵ Cross and Emes, 2016 compare the cost structure of a group of large pension plans managed in Toronto, most of which are in our sample.¹¹⁶ They found “no systematic relationship between the size of pension plan assets and their cost (measured as a percentage of assets).”¹¹⁷ However, Ambachtsheer, et al, 2016 disagree on the basis of the methodology used¹¹⁸ and illustrate that “investment costs as a percent of assets decline by 0.16 percentage points for every 10-fold increase in assets.” The latter study cannot be independently replicated, since that draws on a

proprietary dataset.¹¹⁹ Nevertheless, the CEO of CPPIB was quoted as saying, “... there may be [economies of scale] over time, but I wouldn’t promise it.”¹²⁰

Looking at this issue on a cross-country basis, our dataset – which draws exclusively on reported expenses – illustrates that scale economies are not evident for the Canadian pension plans in our dataset, but are evidenced for the U.S. plans – as depicted in the negative slope of the linear fit in Exhibit 18.

EXHIBIT 18

Expense Ratio to Net Assets



Expense ratio calculated as reported expenses divided by average assets (beginning and end of the fiscal year). Data for all 35 pension plans in the dataset except for Canada Pension Plan, Ontario Pension Board, New Jersey Division of Pension and Benefits and New York City Teachers Retirement System.

Source: Annual reports of pension plans.

The Consortium Model: If pension fund size creates value due to greater portfolio efficiency in generating returns, while economies of scale make a significant contribution to operating costs, how can smaller public pension funds gain access to these benefits?

When Alberta and British Columbia restructured their public pension systems, they centralized investment management in government finance departments. BCI in 1999 and AIMCo

in 2008 eventually became independent government-owned corporations¹²¹ managing assets of provincial public pension plans alongside other government funds.¹²²

Likewise, when the Canadian federal pension plans were restructured in 1999, an independent federal government-owned corporation, PSP Investments, was established to manage the assets held against their post-2000 pension liabilities. Clients of these organizations appear to have harvested similar benefits to those enjoyed by the large Ontario public pension plans – albeit with some trade-offs in terms of customization.¹²³

This consortium model has appealing features for mid-size and smaller pension plans and has become a template for the further evolution of pension fund management in Canada. IMCO was established in 2016 to take on portfolio management of smaller pension plans in Ontario. Similarly, CAAT evolved from its roots as a multiemployer pension plan for employees of colleges in Ontario¹²⁴ to take on third-party clients across Canada.¹²⁵ Each of these organizations is governed by a board comprised of representatives of its clients. Manitoba has also considered pooling of pension assets for the purpose of reducing investment expenses.¹²⁶

It appears that there are two primary benefits from the consortium model. One is aggregation of assets to achieve improved market access and economies of scale. The other is independence from government. Centralizing investment offices has a precedent in the U.S. in the form of the Pension Reserves Investment Management Board of Massachusetts (Mass PRIM), for example, is under consideration in the case of Pennsylvania's two large pension plans,¹²⁷ and is underway in Illinois.¹²⁸

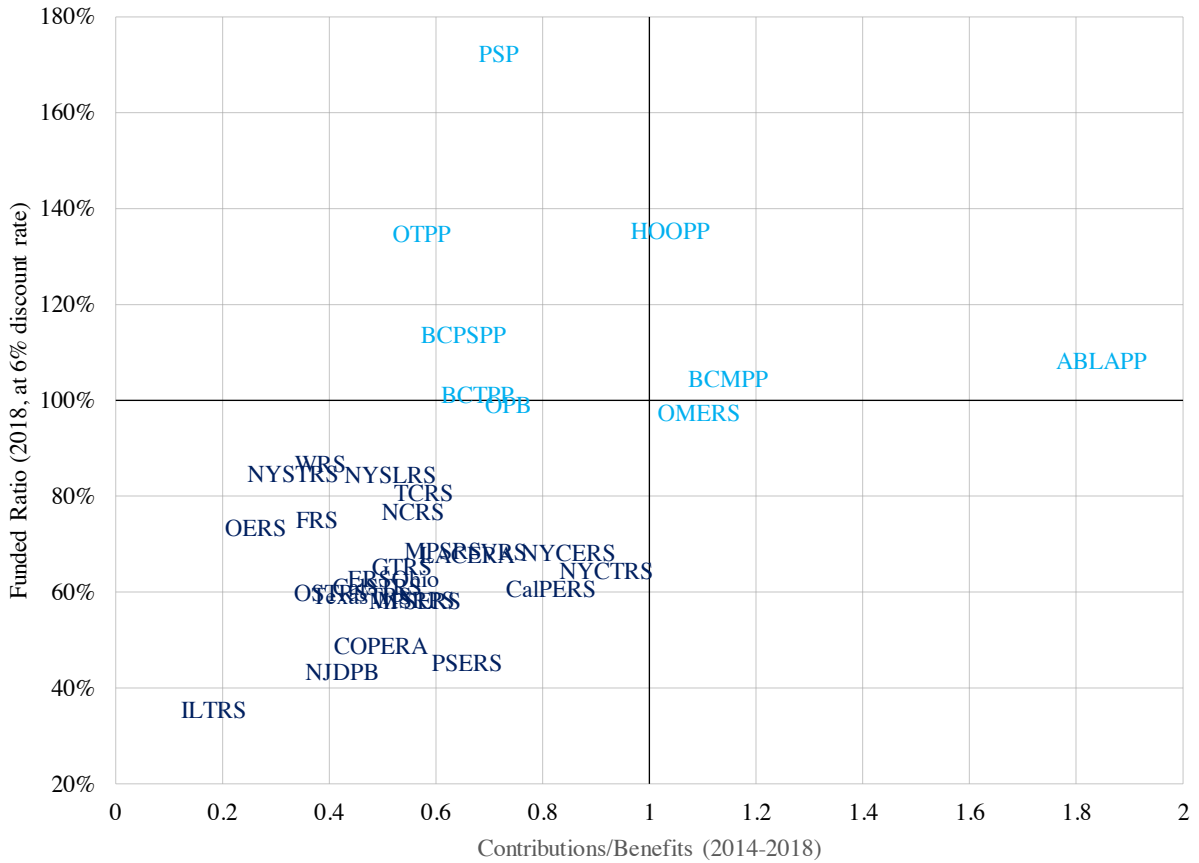
4.6 Investment Strategy

Investment strategy in public employee pension funds is influenced by governance, plan design, and investment organization. We have described significant differences in each of these factors between Canada and the United States. It is unsurprising to find divergence in portfolio design and implementation between large pension funds in the two countries.

Asset allocation: A distinguishing feature of pension portfolio management is the time horizon of pension liabilities, which stretch decades into the future. This explains why pension funds favor long duration assets such as bonds and private market investments. There are, however, two constraints to this feature that explain nuanced differences in asset allocation models between pension plans. One is the shortfall (or excess) of current contributions relative to benefit payments. The other is the funded status of the plan. These can be viewed respectively as cash-flow and balance-sheet constraints.

Consider Exhibit 19 which charts the pension funds in our sample along two axes – one being funded status¹²⁹ and the other cash flows. It is evident that all Canadian pension plans are at full funding or in surplus, while all of the U.S. plans are in deficit.¹³⁰ Also evident is that some Canadian pension funds have positive cash flows whereas others – as well as all U.S. pension funds – have negative cash flows.

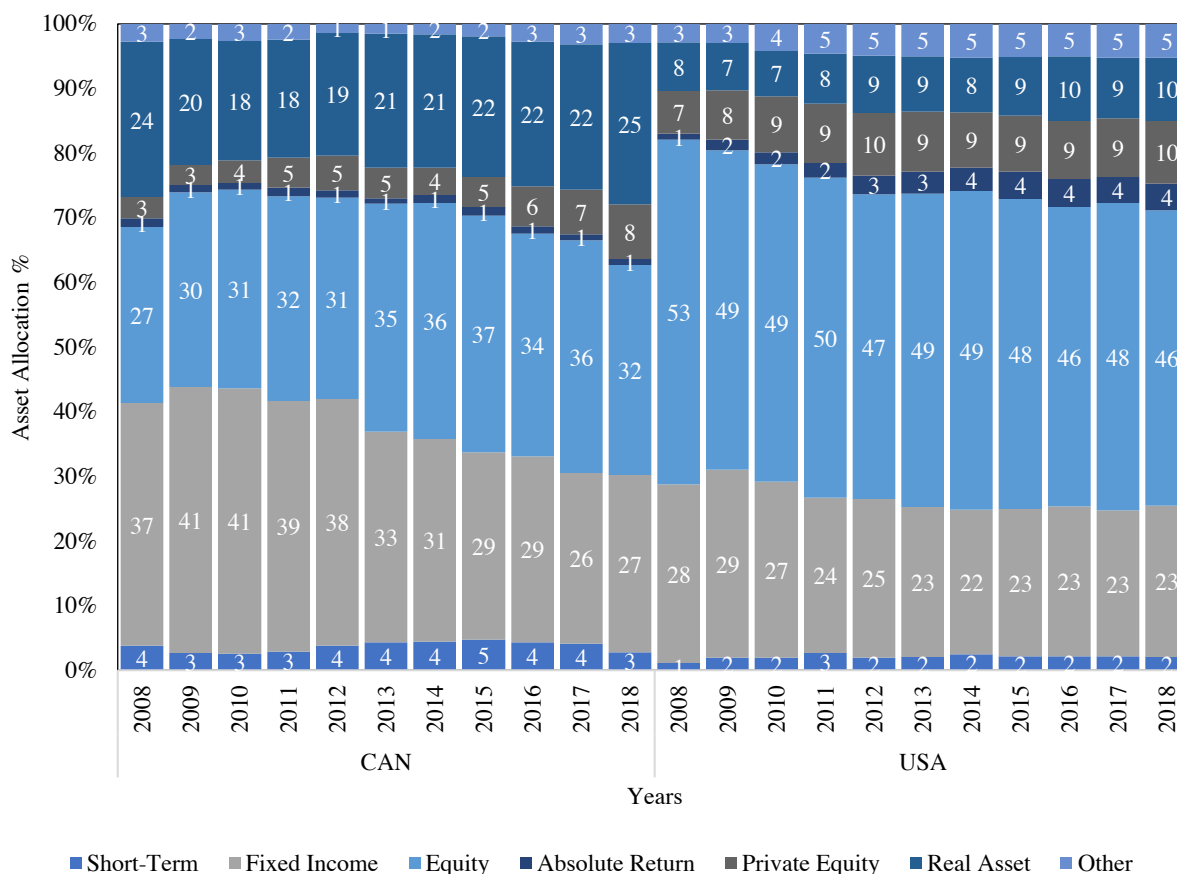
Funded Ratio and Net Cash Flows



Data for all 35 pension plans in the dataset except for Canada Pension Plan. All funded ratios estimated using a 6% discount rate with: Adjusted Liabilities = Reported Liabilities x $\{1 + [(reported\ discount\ rate - 0.06) \times 15]\}$
Source: Annual reports of pension plans.

Exhibit 20 shows the average asset allocation of pension funds in the two countries. Canadian plans have larger fixed income portfolios (27.4% compared with 23.4% in the U.S.) and more real asset exposure (25.0% compared with 9.8% in the U.S.).¹³¹ They are fully funded at reported discount rates which are lower than those in the U.S. Their primary focus is on matching assets to long-duration liabilities¹³² and generating yield to address cash flow deficits.¹³³

EXHIBIT 20
Average Asset Allocation (%)

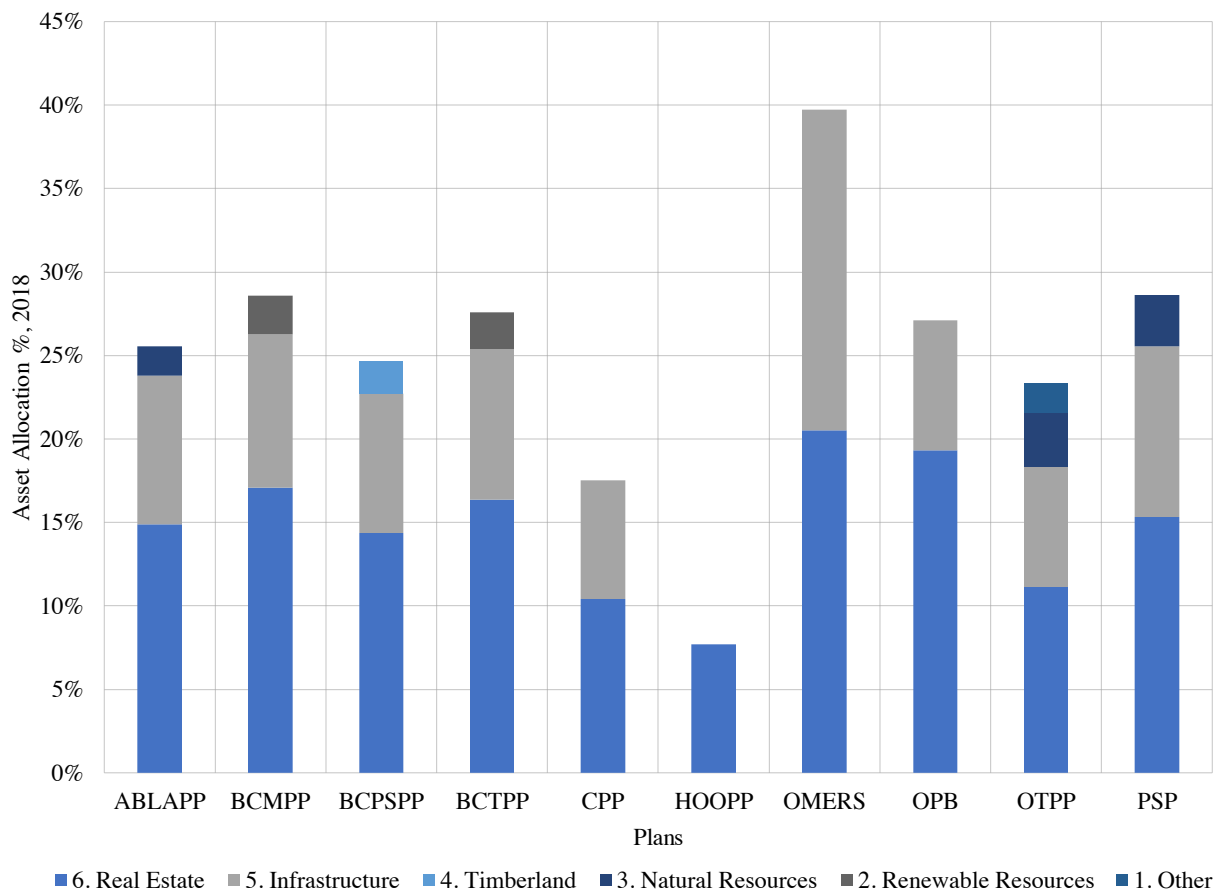


Data for all 35 pension plans in the dataset.
Source: Annual reports of pension plans.

Exhibit 21 shows the composition of the real asset allocation of Canadian pension plans. What is not evident from the data – but requires deeper review of the composition of portfolios – is the nature of these investments. When U.S. plans invest in real assets, they do so largely through private equity-style funds in order to capture the illiquidity premium they expect from private equity.¹³⁴ When Canadian plans invest in real assets, it is geared towards long-term (even permanent) investments with an orientation to the current cash flows that such assets generate.

EXHIBIT 21

Real Assets Average Asset Allocation (Canadian Pension Plans, 2018)



Source: Annual reports of pension plans.

Pension plans in the United States take on more equity risk, in the form of higher exposure to both listed equities and private equity – in aggregate, 55.4% of portfolios, compared with 40.8% in Canada.¹³⁵ They also differ in the way they invest in real assets. With weaker funded ratios and relatively high discount rates (see Exhibit 14), they tend to invest with an eye on maximizing investment returns in the form of capital appreciation.

Exhibit 19 also illustrates the key challenge facing U.S. public pension plans. There is simply no investment strategy that can enable them both to earn enough yield to fund their benefit payments (x-axis)¹³⁶ while at the same time generating capital appreciation to restore their funded status (y-axis). This shows why addressing pension funding exclusively or primarily through the lens of investment management is not a viable solution.

Portfolio Leverage, Derivatives, and Currency Hedging: An area where U.S. and Canadian pension plans diverge significantly is in their willingness and ability to incorporate portfolio leverage. Many Canadian plans make extensive use of leverage. Few U.S. plans use more than modest leverage. Enhancing investment returns through more efficient use of balance sheet is certainly a driver of the use of portfolio leverage, although it is applied in different ways by different pension investors. OTPP, for example, uses leverage¹³⁷ to increase its exposure to private

markets. HOOPP, by contrast, uses leverage to increase its bond holdings.¹³⁸ The former introduces more portfolio risk than the latter.

Along with leverage, the use of derivatives is also much more prevalent in Canada than in the United States. While the initial exposure to derivatives by OTPP and HOOPP was developed in a roundabout way,¹³⁹ this has become a fundamental tool for Canadian pension funds, albeit not without risk.¹⁴⁰

Currency hedging is not a substantial concern for U.S. pension plans since so much of their portfolios is denominated in U.S. dollars. This is less true for Canadian pension funds, which allocate a much greater share of their portfolios outside their home country.¹⁴¹ The approach to hedging is idiosyncratic. OTPP often takes unhedged exposure, while HOOPP significantly hedges foreign exchange exposure.

4.7 Investment Performance

Comparing investment performance between pension systems is complicated, even more so when national boundaries are introduced.¹⁴² But since the “output” of any investment strategy is risk-adjusted investment returns, it needs to be addressed. Moreover, past investment performance can shed light on expected investment performance which is the basis of determining discount rates, as we have discussed.

Exhibit 22 shows that the Canadian pension systems in our sample outperformed their U.S. peers over both five- and ten-year periods.¹⁴³ At the level of individual asset classes (see Exhibit 23) it is interesting that the one asset class in which U.S. plans meaningfully outperformed their Canadian peers is real assets, precisely the asset class in which Canadian plans have considerably larger relative allocations than those of their U.S. peers. But this finding may be expected in view of the type of exposure preferred by public pension funds in each country from real assets, as we have discussed above.

EXHIBIT 22**Trailing Investment Performance (2014-2018 and 2009-2018)**

	Canada	U.S.
Five-year plan mean	8.54%	8.01%
Five-year plan median	8.16%	8.44%
Ten-year plan mean	8.99%	6.79%
Ten-year plan median	8.68%	6.79%

Data for all 35 pension plans in the dataset except for Canada Pension Plan. Ten-year data for Canadian pension plans excludes OPB (2008-2011), BCPSSP (2008-2013), and ABLAPP (2008-2009). All data reported by pension plans in domestic currency terms.

Source: Annual reports of pension plans.

EXHIBIT 23**Average of Trailing Return and Standard Deviation by Asset Class (2014-2018)**

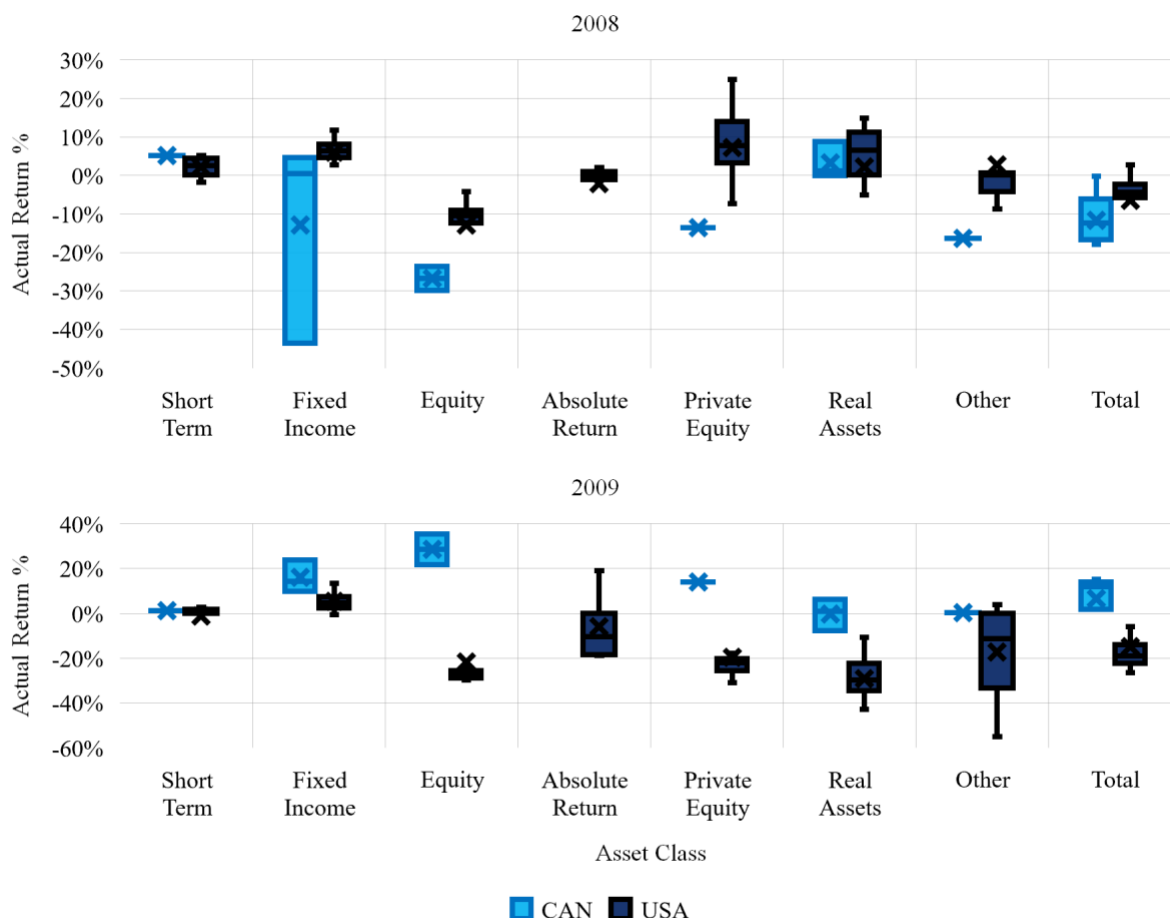
Asset Class	Return		Std. Dev.	
	Canada	U.S.	Canada	U.S.
Absolute Return	N/A	3.37%	N/A	3.86p.p.
Equities	8.93%	9.46%	9.09p.p.	11.44p.p.
Fixed Income	4.09%	3.06%	3.50p.p.	2.82p.p.
Other	4.61%	2.42%	4.25p.p.	9.14p.p.
Private Equity	15.61%	13.94%	4.95p.p.	5.90p.p.
Real Assets	8.46%	11.42%	2.56p.p.	3.11p.p.
Short-Term	2.41%	0.60%	2.65p.p.	0.37p.p.
Total	8.54%	8.01%	4.34p.p.	6.43p.p.

Excludes Canada Pension Plan. All data reported by pension plans in domestic currency terms. Standard deviations are reported in percentage points ("p.p.").

Source: Annual reports of pension plans.

A final observation on investment returns is the experience of public pension plans in the two countries during the Global Financial Crisis, see Exhibit 24. The U.S. public pension plans performed better than those in Canada in 2008, but considerably worse in 2009.¹⁴⁴

EXHIBIT 24 Total Returns



Data reflects asset classes reported by each of the pension plans (Canada dataset includes between two and six plans, U.S. dataset includes between seven and twenty-five plans). We exclude outliers.
Source: Annual reports of pension plans.

5 KEY LESSONS FROM CANADA

We have examined public employee pension reform undertaken in Canada, leading up to the current system, one that is widely admired for achieving its economic contribution and political mandate. We illustrated key differences between public employee pension funds in Canada and the U.S. using our primary dataset. We now turn to a series of lessons from the Canadian experience to address what is becoming a critical public finance challenge in the United States

5.1 Recognizing the need for change

The first lesson is the realization and acceptance among key constituencies that meaningful change is needed. The quotation at the beginning of this article from the 1981 Presidential Commission shows that none of the basic concerns with respect to pension system viability is new. While public pension funding improved over the course of the last decade of the 20th century, it has deteriorated since¹⁴⁵ as fundamental concerns with the way plans are designed and funded, and their portfolios invested have become evident.

We have described reforms undertaken in Canada and illustrated that it took time for the realization to sink in that change was needed. Ultimately, recessions, persistent inflation, and demographics catalyzed reform. The U.S. public employee pension problem has generated a great deal of talk but – with a few exceptions – very little action. The Canadian “tipping point” that underpinned thorough reform has not yet been reached in the U.S.

The Covid-19 pandemic has introduced new stressors to pension finance. Portfolio balances have been impaired. Liabilities will grow as the realization that future portfolio performance may well be subdued. Most importantly, funding sources will be strained as state and local governments deal with reduced tax revenue and larger expenditures, even net of funding received from the federal government.¹⁴⁶

5.2 No easy top down solution

Public pensions are extremely complex systems. Each jurisdiction has its own plan design and legal and regulatory framework. Change cannot be imposed from above. We have illustrated how reform of CPP and in Ontario and Alberta happened because concerns pertaining to each jurisdiction forced a reckoning in each case.

Reform in the U.S. cannot easily be accomplished top-down by the federal government.¹⁴⁷ Importantly, the United States government is not a party to pension arrangements in states, localities and special districts.¹⁴⁸ At the same time, the issue is too complex for each individual county and municipality to tackle on its own.¹⁴⁹ It should instead be addressed at the state level and at the federal level only in extreme circumstances.

5.3 Strong leadership backed by an effective civil service

Change does not occur spontaneously. In each of our Canadian examples, a strong leader emerged to shepherd the necessary change. This was someone with the analytical ability to envision a viable end-state, the credibility to bring all stakeholders to the table, and a willingness to expend the political capital needed to convince each to give something up in order to benefit everyone. Such people must rise to prominence in the U.S. states and municipalities facing ongoing pension challenges. At the same time, reform in Canada was enabled by very strong technocrats in civil service roles in the provincial and federal treasuries. Canada’s smaller population and sharing of ideas between these experts allowed for cross-fertilization of best practices and explains the relatively similar series of reforms adopted across the country.

5.4 A stakeholder approach

Once the reality was fully appreciated in the Canadian context and actuarial solutions proposed and developed, reform of the CPP involved meetings across the country with key interest groups. An important lesson is the need to engage all stakeholders in developing and selling a viable long-term solution based squarely on the public interest.

Under U.S. law, pension fiduciaries are required to prioritize the interests of plan beneficiaries.¹⁵⁰ But underfunded pensions create risks for taxpayers, municipal bondholders, and users of government services.¹⁵¹ Each group of stakeholders is put at risk by accumulating pension fund deficits.

The complex nature of pension obligations is not well understood by the average citizen in the U.S., nor are the risks that face taxpayers from compounding shortfalls in pension funding. The \$3.8 trillion municipal bond market is likewise impacted by pension solvency issues. This is why rating agencies incorporate pension funding in municipal bond ratings.

Priority rights of claimants in municipal finance is a complex topic, pitting bondholders and pensioners on opposite sides when there are scarce financial resources.¹⁵² Residents of states, counties, and municipalities who are the “customers” of public services are exposed to the risk of reduced services if governments are forced to triage across stakeholder groups.¹⁵³ So any solution must consider the equitable balancing of interests of all principals, not just pension beneficiaries. And it will be important to convene competing interest groups in developing solutions.

5.5 Pension math that works

We have argued that Canada embodies conservatism in determination of pension funding formulas, particularly with respect to the all-important discount rate. Moreover, contributions and benefit payments are evaluated holistically, so that adjustment of one results in automatic adjustment of the other.

In the U.S., by contrast, discount rates are too high, and benefit levels and contributions are determined independently of each other,¹⁵⁴ so solvency is not ensured. Discount rates should be revisited, benefit levels moderated,¹⁵⁵ and full funding mandated in negotiations.¹⁵⁶

5.6 Equitable sharing of the funding burden

The burden of funding contributions is shared approximately equally between employees and employers in Canada. In the U.S., it is skewed heavily towards plan sponsors (i.e. the taxpayer), with plan members funding only one-third of total contributions.¹⁵⁷ This feature should be revisited. Pension entitlements, are, after all, a part of compensation packages negotiated between public sector employers and employees.

5.7 Mandated funding

In Canada, plan sponsors generally fund the full amount of their actuarially determined contributions and when they do not, under the jointly-sponsored construct, liabilities are amended accordingly. The situation is very different in the U.S.

While employee contributions are predictably funded through payroll deductions, government contributions in many states are funded subject to budget appropriations with “funding holidays” not uncommon. This goes a long way toward explaining why U.S. pension plans have accumulated large funding gaps that will inevitably have to be addressed.

Any reform in the U.S. must be predicated on requiring that contributions be funded. This is certainly a challenge, considering pressures on public finances due to the Covid-19 pandemic, with lower tax revenue and higher expenditures.

5.8 Joint sponsorship – aligning benefits with responsibilities

A salient aspect of Canadian pension reform was adoption of the joint sponsorship model,¹⁵⁸ bringing employee groups to the table. They provide input into plan design and assume shared responsibility for plan solvency.¹⁵⁹ All other governance dimensions flow from this fundamental feature.

Canadian pension systems are structured as trusts which are the obligor of pension liabilities. As a result, liabilities are isolated from government.¹⁶⁰

Plan governance entails two distinct functions – design¹⁶¹ and administration.¹⁶² In a bicameral structure, these are overseen separately. The example of OMERS is illustrative:¹⁶³ OMERS Sponsors Corporation is responsible for plan design and risk oversight.¹⁶⁴ OMERS Administration Corporation oversees day-to-day plan management including collecting contributions, paying benefits, and investing plan assets.¹⁶⁵ Governance comprises representatives of both employer and employee groups.¹⁶⁶

Joint sponsorship should be considered in the U.S.¹⁶⁷ The reality is a disconnect between the beneficiaries of public employee pension funds and those who help fund them. In the absence of reform, this will necessarily lead to an adversarial relationship if and when restructuring becomes necessary. This dynamic is unfortunate in that public sector workers are responsible for many of the essential services that benefit taxpayers.¹⁶⁸

5.9 Enhanced governance

At its worst, governance failure is evidenced by corruption and malfeasance. What might go wrong? Investment offices, particularly when overseen by less sophisticated boards, may select overpriced or excessively risky assets and incur high transaction charges in return for kickbacks from the sellers of investment products. The more complex and opaque the product, and the harder it is to value, the more likely will be transfers of wealth to agents and agents of agents, i.e. financial intermediaries.

Rather than address underlying governance weaknesses, the U.S. has moved toward a “belts and suspenders” approach to patch-up governance gaps.¹⁶⁹ In order to repel bad actors, many states have introduced what are essentially burdensome compliance protocols, which are reflected in friction costs and effect investment returns.¹⁷⁰

Pension governance is evidenced most directly in board composition. Canadian pension boards in most cases comprise trustees with significant relevant professional experience.¹⁷¹ U.S. pension plans rarely require trustees to have prior expertise in the areas of pension finance or investing. Trustee education is a viable way of ensuring minimum standards in these areas, particularly in the case of new trustees.¹⁷² But it is less common than it should be. Enhanced governance should be a key focus of reform in the U.S.

5.10 Unified legislation

Coherent, well thought-through legislation in the Canadian provinces has enabled strong pension systems. The country has a far smaller population and fewer jurisdictions than the U.S. and as a result there is a much higher degree of uniformity in pension laws nationally.¹⁷³ Moreover, the same rules apply to both private and public pension plans in each province.¹⁷⁴ This simplicity is a positive feature. Certain pension plans in Canada are enabled by their own legislation,¹⁷⁵ with governance terms defined in statute.

By contrast, public pension regulation in the United States is highly decentralized. Plans are exempt from most of the provisions of the Employee Retirement Income Security Act (ERISA), which governs private pension plans.¹⁷⁶ In the absence of uniformity, public plans are subject to a complex web of state laws and various interpretations by the courts.

When ERISA was enacted in 1974, it called for a Congressional study into the feasibility of federal legislation and standards for public plans.¹⁷⁷ The study found, among other deficiencies, “an incomplete assessment of true pension costs at all levels of government due to the lack of adequate actuarial valuations and standards.” It concluded that “...clearly, a uniform standard of fiduciary conduct is needed to conform public employee retirement system administrative and investment practice with the practices expected of other important financial enterprises.”¹⁷⁸ No such uniform standards have ever been enacted.¹⁷⁹

This is one area in which the federal government could play a supportive role. The U.S. already has the legal infrastructure in the form of the Uniform Law Commission, which could be utilized for this purpose.¹⁸⁰

5.11 Funding accumulated deficits – fixing past mistakes

It is impossible to fix pension funding on a prospective basis without addressing accumulated deficits. These deficits result from decisions taken decades ago as well as from the continued refusal to address this issue, bequeathing an unwanted legacy from one generation to the next. Deficits will need to be amortized in such a way that they are fully extinguished over the long term without the use of smoke and mirrors.

Political solutions from negotiations between parties will determine how the amortization is funded, balancing the interests and the relative political power of all principals – plan members, taxpayers, bondholders, and users of services. In Ontario, the government agreed to absorb the full cost of unfunded liabilities, but in Alberta, employees were forced to absorb half of the cost of amortizing liabilities. However funded, intergenerational inequity will undoubtedly materialize.¹⁸¹

Given the wide differences in pension fund viability among U.S. states, municipalities and other public sector entities offering employee pensions, pleas for federal bailouts of the weakest plans immediately run into adverse selection and moral hazard. They are sure to face vehement opposition from voters and taxpayers whose public pension structures have been adequately funded and run in a responsible way.

5.12 Aligning investment strategies to liabilities and cash flow matching

There are fundamental differences in asset allocation between Canadian and U.S. pension plans. We have argued that these are partly due to differences in levels of funding. Canadians have long sought to match asset duration and cash flows to liability streams. U.S. plans, which need to catch-up on funding gaps, set high target rates of return and tend to favor equity risk and exposure to market downturns.

Long term sustainability in funding levels is predicated on both cash flow and liability matching, rather than a search for maximizing investment returns. Once funding challenges have been addressed, portfolios should be conformed to this objective. Failure to do so shifts risks to future taxpayers, bondholders, and recipients of public services.

5.13 Internalizing investment management

A fundamental feature of Canadian public pension plans is the insourcing of investment activity, particularly in the area of private market investing. This is predicated on strong governance and a willingness to establish investment teams of sufficient size compensated with market-rate remuneration.

While some U.S. public pension systems have moved in this direction, particularly with respect to the public market investing activities, doing so is very complex. One solution might be to aggregate the investment management of smaller pension plans or even outsource investment management to quasi-public sector investment managers as has been done in Canada, leveraging the consortium model.

5.14 Searching for a consortium model – achieving size and scale

Although Canada has a smaller economy and population than the U.S., its largest public pension funds are within the size range of the largest U.S. plans. We have illustrated benefits to scale. The smaller among the large U.S. plans in our sample are simply not large enough to adopt the most sophisticated approaches to investment management. This is considerably more relevant for the hundreds of mid-size plans and thousands of smaller plans.

The Canadian provincial pension investment organizations represent a solution worth exploring. AIMCo, BCI, CDPQ, IMCO, and PSP Investments are all government-owned agencies formed out of finance departments to manage portfolios for public sector pension plan clients in a way that those pension plans could not do themselves.¹⁸² Similar organizations could be established in the U.S. – either as public-sector agencies or as private sector firms operating for public sector clients.

Operated and governed at arms-length from government, such organizations would be exempt from public sector compensation rules, and hence able to establish appropriately staffed teams. This would work best with clients of similar size, so no outsize clients overshadow the others. Additionally, governance rules would be essential in order to ensure long-term alignment of interests between partners in the consortium. This type of organization could be developed organically or be formed through the acquisition of one or more existing private sector investment managers. Such consortia might even limit themselves to distinct asset classes for clients.¹⁸³

With a model that has proven successful in their home country, might certain of the Canadian organizations expand south of the border to take on management of portfolios for smaller U.S. pension plans – perhaps on a cost-plus basis? Or might they help peers in the U.S. establish similar organizations?¹⁸⁴

5.15 Advisor standards

Budgetary and governance constraints typical of U.S. public pension plans introduce a significant degree of dependence on external advisors, particularly investment consultants and actuaries.¹⁸⁵ Excessive dependence on “agents of agents”¹⁸⁶ heightens the oversight burden on boards, a challenge that is compounded by the absence of minimal professional standards for board members.

A corollary is that advisors’ recommendations must be scrutinized for conflicts of interest, since they have a material incentive to tell boards what they want to hear. This concern arises in the case of investment consultants determining asset allocation models, selecting fund managers,¹⁸⁷ and proposing discount rates. It exists too in the case of actuarial advisors opining on discount rates and with fund managers whose motives are to generate fees and crystalize investment gains at times that are opportune to them, not necessarily to their clients. Advisors to U.S. plans should be held to high fiduciary standards and it might be advisable to have actuaries engaged by taxpayers, not pension boards.

Exhibit 25 summarizes our roadmap to reform.

EXHIBIT 25**Pension Reform: Lessons from Canada for the U.S.**

	Policy Initiative	Detail
1	Recognize the need for change	Take advantage of exogenous factors as a catalyst for change (such as the current economic environment)
2	Recognize that the solution needs to be at the appropriate level of government	Given the need to address reform in a holistic way, change should occur at least at the state level
3	Recognize that change requires strong leadership and effective civil service	Strong leaders must emerge in each state, they do not exist in a vacuum and require the support of highly effective technocrats in the civil service, enabling forums for sharing knowledge between jurisdictions
4	Adopt a consultative stakeholder approach to develop and implement reforms	Recognize that taxpayers, bondholders, and recipients of government services – not just plan members and retirees – are stakeholders in pension systems and involve all parties in the reform process
5	Focus on holistic models for pension design and funding	Potentially restructure funding models to target solvency as a primary objective, rather than have benefits, contributions, and investing determined distinctly; remove plan terms from collective bargaining (ensuing compromises often result in non-sustainable outcomes)
6	Share burden of funding contributions more equitably	Understand pension funding within the framework of total compensation and if appropriate, consider a more equitable share of funding from plan members (from 33% to 50%)
7	Mandate sponsor funding	Hold governments accountable, require funding of contributions
8	Align benefits and responsibilities through joint sponsorship	Move from paternalistic model to construct where plan members have a seat at the table and assume shared risk for solvency
9	Enhance governance	Establish high standards for trustees, trustee education
10	Unify legislation	Use existing tools for unified pension legislation, reconsider possibility for national standards
11	Ensure viable model for funding accumulated deficits	Amortize unfunded liabilities using combination of sponsor funding and plan member contributions
12	Align investment strategies to liabilities and cash flows	Once plans are better funded, match asset allocation to liability management
13	Internalize investment management, where appropriate	Evaluate ability to address governance and compensation constraints in order to facilitate direct investing approach
14	Evaluate consortium model to achieve scale, where appropriate	Consider establishing consolidated investment management for groups of pension plans to achieve scale and reduce expenses
15	Enhance advisor standards	As internal resources and governance are improved, enhance expectations from service providers

6 SUMMARY AND CONCLUSIONS

It is widely agreed that the U.S. public employee pension system needs to be reformed. In this article we have used the Canadian example to show that identifiable and practical reforms are conceptually sound, politically feasible, and successfully tested. They are in the public interest.

A framework can be envisioned that weighs the respective impact on, and influence of each of the key stakeholder groups: public-sector employees, taxpayers, public-sector employers, bondholders, and users of public services. Their respective degrees of influence may vary among jurisdictions. In some, labor may be very organized and wield a great deal of power compared to

others. Similarly, taxpayer activists are watchful and persistent in some jurisdictions but much less so in others. Some jurisdictions have large pools of municipal bondholder claimants, others do not. Negotiations will be necessary and sometimes difficult.

The Canadian example shows that a result in the broad public interest can be achieved. It is not perfect in terms of meeting rigorous criteria of efficiency, equity and sustainability, but here perfect is the enemy of the good and progress achieved is well worth considering seriously. And over the past 30 years it has benefited from supportive exogenous factors in terms of demographics, interest rates, and equity market performance, which may not be the case in the future. Moreover, Canada and the United States are different in their histories, cultures, institutions and political dynamics.¹⁸⁸ But that should not be a barrier to importing ideas that work into a highly diverse and chaotic public employee pension system that has evidenced patches of weakness.

The Canadian experience also suggests that change in the U.S. will have to be undertaken primarily at the state level and requires strong leadership and engagement from all principal stakeholders. We have proposed an array of initiatives that together represent a roadmap, checklist, or SWOT diagnostic to engage stakeholders in a way that ultimately balances their respective interests to determine the best practical outcome in each situation. Such initiatives will ultimately determine viable benefit and contribution policy, discount rates, legal structure, governance, legislation, and approaches to investment management.

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¹ Report of the President's Commission on Pension Policy, U.S. Senate, May 15, 1981.

² Lipshitz and Walter, 2019.

³ <https://www.census.gov/data/tables/2019/econ/aspp/aspp-historical-tables.html>. Elsewhere we cite the 2018 data.

⁴ This is set against \$9 trillion in liabilities. Asset and liability data as per Federal Reserve Z.1 (Financial Accounts of the United States), First Quarter 2020, Table L.120 (z.1). Link: <https://www.federalreserve.gov/releases/z1/20200611/z1.pdf>. Liability data in the Federal Reserve report is sourced from the Bureau of Economic Analysis, which, in its September 2018 release, changed the methodology by which it reports this data from an accumulated benefit obligation (ABO) method to a projected benefit obligation (PBO) method. The PBO method is used to report federal government defined benefit pension obligations, so this change facilitated greater consistency in reporting. The PBO method includes future wage growth while the ABO method does not, see <https://apps.bea.gov/scb/2018/04-april/0418-preview-2018-comprehensive-nipa-update.htm>. Because

of this accounting change, the funded status reported by the plans (which is the baseline for our study) is considerably higher than that reported by the Fed. All other data herein is as of the end of the fiscal year 2018, the most recent year for which full reporting is available. It should be noted that pension obligations are not absolute liabilities, but rather anticipated liabilities, as they are calculated based on the assumed actuarial duration of the lives of beneficiaries, which may prove to be incorrect.

⁵ Municipalities can restructure debt through bankruptcy proceedings under Chapter 9 of the Bankruptcy Code.

⁶ A synthesis of key reforms undertaken in Canada is provided in Exhibit 5.

⁷ While the federal government does not play a role in state and local government pension plans, that may not remain the case forever. A 1979 report by the Comptroller General of the United States observed that "... sound funding of the plans is a national problem which may eventually require congressional action. The Congress should closely monitor actions taken by State and local governments to improve their plan funding to determine whether congressional action may be necessary and, if so, at what point." (Report to Congress by the Comptroller General of the United States, 1979). The Municipal Lending Facility, authorized under the Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020 allows the Federal Reserve to purchase up to \$500 billion in municipal bonds, see: <https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20200603a1.pdf>. This makes it a principal in this part of the economy.

⁸ These include public employees and their unions, taxpayers, municipal debt bondholders and end-users of government services.

⁹ Every one of the largest public pension plans in Canada is near full funding or in surplus (see Exhibit 1). The 30th Actuarial Report of the Canada Pension Plan, published March 18, 2020 concludes that "the legislated contribution rate of 9.9% is sufficient to finance the base CPP over the long term" <https://www.osfi-bsif.gc.ca/Eng/Docs/CP30.pdf>.

¹⁰ See for example World Bank, 2017.

¹¹ Pension obligations were included as liabilities on government balance sheets.

¹² Eight of these are provincial plans and one, Public Service Pension Plan, is a federal plan. Healthcare of Ontario Pension Plan is not a public sector plan as its employer groups include both public and private sector employers in the healthcare sector. We exclude pension plans sponsored by the province of Québec, including both Québec Pension Plan (which mirrors the Canada Pension Plan) and the Government and Public Employees Retirement Plan (RREGOP) since pension plans in that province do not publish full financial statements in English and because their investment manager, Caisse de dépôt et placement du Québec, which manages 40 Québec investment pools, has an investment mandate that extends beyond being a pension fiduciary.

¹³ CPP is a social insurance program. We include it in our sample because it is well known as a sophisticated investor and because its reform in the 1990s incorporates many of the best features of the Canadian Model and provides a roadmap for U.S. decision makers.

¹⁴ Twenty-two of these are state plans, two are city plans (both sponsored by New York City) and one is a county plan (sponsored by Los Angeles County).

¹⁵ Canada exited the recession of the early 1980s with persistently high levels of inflation, which remained above 4.0% between 1986 and 1991 (World Bank data). Bank of Canada restrictive monetary policy in the late 1980s, and the novel target-inflation regime announced in 1992, were effective in reducing inflation to 1.7% by 1992 (Wilson, et al, 1994). The recession of 1990-1991 (partly attributed to an increase in taxes), resulted in unemployment levels that reached 11.4% in 1993 (World Bank data). The subsequent recovery was tepid, with growth in GDP averaging 1.3% over seven quarters (Wilson, et al, 1994). Public sector finances deteriorated over this time, with government spending rising from 37% of GDP in 1973 to 43% in 1992. The government deficit more than tripled, to 8% of GDP (Thiesen, 1999), leading both Standard & Poor's and Moody's to lower their ratings on Canada's sovereign debt in 1992 and 1994, respectively (Palmer and McCrank, 2011). Additionally, projected population growth was slowing (see Footnote 34).

¹⁶ In PAYGO systems, pension benefits are funded from current contributions.

¹⁷ In the sense that they were notionally funded.

¹⁸ Certain plans benefited from retroactive inflation indexation without a concomitant increase in contributions. This was problematic considering the high inflation of the 1970s.

¹⁹ Separate accounting of contributions was certainly maintained.

²⁰ Instead, pension reserves were lent to the provinces in the form of non-marketable debentures.

²¹ Once plans were made contractual, it became much easier for plan sponsors to adjust plan design features and therefore ensure plan solvency.

²² Canada's largest province by population and GDP.

²³ The wealthiest province on a per-capita basis.

²⁴ Our argument here does not suggest that every public pension plan in Canada was reformed in the way that CPP and the Ontario and Alberta plans were. Some of the smaller provinces have not undertaken these steps or did so much later. The pension plans for employees of the federal government remain under government sponsorship.

²⁵ Joint sponsorship is fundamental to the Canadian public pension system – it brings employers and employees together in decision making, with joint responsibility for contributions and hence pension solvency

²⁶ See for example World Bank, 2017, which refers to “strong, independent governance.”

²⁷ Acting on behalf of taxpayers, government entities – the employers of plan members – are an important stakeholder for which pension benefits play an essential role in recruiting and retaining public sector workers.

²⁸ CPP and the Old Age Security program (OAS) provide retirement income to Canadians. CPP is employment-based, while OAS is residency-based. OAS, which is clawed back if post-retirement income exceeds certain thresholds, is somewhat akin to U.S. Social Security. It is not-prefunded, benefits are paid from general tax revenues. Residents of the province of Québec are excluded from CPP and receive their retirement benefits through the Québec Pension Plan, which has virtually identical terms. From the start, CPP was jointly administered by the Department of Finance and the Department of National Health and Welfare (now Health Canada).

²⁹ Much of this history is from Little, 2008 – a book-length study commissioned by the CPP Investment Board to document the evolution of CPP.

³⁰ Self-employed workers fund the entire contribution themselves.

³¹ The rate itself was not determined actuarially, but rather represented a political compromise between the federal government’s preference for a 2% rate and the Québec preference for a 4% rate. Little, 2008, page 39 describes that there were those who argued for full funding of CPP, but that this was a controversial position as it would have required much higher levels of contributions and would have “concentrate[d] overwhelming control of capital in the hands of governments or their agencies.”

³² This was done pro rata to each province’s share in contributions, effectively allowing the provinces to borrow cheaply from the federal government at an interest rate equal to that on 20-year Canada sovereign bonds (Little, 2008, page 50).

³³ These concerns were articulated very clearly in annual actuarial reports. See Bayoumi, 1994 for a discussion of the inter- generational inequity considerations in adjusting benefits and contributions. Kramer and Li, 1997 cite several factors to explain the growth in CPP’s estimated liabilities relative to earlier projections. These include lower birth rates, longer life expectancy, slower growth in real wages, benefit enrichment, and a rise in disability expenditures.

³⁴ Generally, the math was that the first critical point would occur in or about 1985; the second in or about 1995; and the third in or about 2004. In 1970, the chief actuary proposed increasing contributions to 7.2%. In 1978 – to 5.4%.

³⁵ This was due to the 1981-2 recession.

³⁶ Due to lower fertility and longer life spans, the worker-to-retiree ratio was predicted to decrease from six-to-one to three-to-one in fifty years. Moreover, it was projected that failure to act would mean contributions would have to increase by almost 100% by 2003 and that higher taxes would ensue when the provinces would begin to repay loans beginning in 1994.

³⁷ The Progressive Conservatives won control of parliament from the Liberals in 1984 for the first time since the early 1960s. Pursuant to legislation that came into effect on January 1, 1987, contributions would increase by 0.2% per year for five years, to 4.6% by 1991, and by 0.15% for the following twenty years, to 7.6% by 2011. This would be partially offset by the right for earlier retirement with reduced benefits. In 1991, there was no change to the benefit formula.

³⁸ This report followed the 1991-92 recession.

³⁹ Little, 2008, page 83.

⁴⁰ The Liberal Party retook control of parliament in 1993. A primary focus of the new Minister of Finance, Paul Martin, future Prime Minister of Canada, was to reduce the federal budget deficit to 3% of GDP.

⁴¹ It is worth noting that CPP was earning 11% (a 9% real return) on 20-year provincial government bonds in 1995 and the provinces were operating with budget surpluses, so they had less need than before for tapping into CPP’s reserves.

⁴² Besides for CDPQ, which had been investing in markets since 1966, several Ontario public pension plans, notably Ontario Teachers’ Pension Plan and Ontario Municipal Employees Retirement System, were by now active investors in markets.

⁴³ “An Information Paper for Consultations on the Canada Pension Plan.”

⁴⁴ The idea was to invite “groups with disparate views to sit down for a morning or an afternoon around a table, where they would present their views and then discuss the issues with the others.” Martin saw two objectives for this process – seeking out of the views of Canadians on possible solutions and winning political support for the end result (Little, 2008, page 161).

⁴⁵ In aggregate, 219 organizations and 59 individuals participated in these sessions and 144 written submissions were received.

⁴⁶ Little, 2008, page 169. Unlike with CDPQ, there was a clear preference for the fund to focus exclusively on investment returns without a dual mandate of promoting economic development.

⁴⁷ Legislation was filed with parliament on February 14, 1997 and formal hearings began on October 28, 1997, ironically, a week after the stock market crash.

⁴⁸ The government of Canada does not publish estimated pension liabilities of CPP. Menard, 2010 explains that “an independent peer review panel expressed concern that most readers would be unduly distressed that the CPP is not expected to ever be even one-third funded” and that this panel “recommended minimizing or removing point in time funded status indicators from the actuarial report.” He argues that a sovereign credit rate should be used to discount liabilities, rather than a market rate which is used to value provincial pension fund liabilities. Using this approach, the investment pool accounted for approximately 20% of CPP’s liability at the time. An optional enhancement to CPP introduced in 2019 provided for additional benefits fully funded by increased contributions. As we have noted the current chief actuary has found the level of contributions to be sustainable.

⁴⁹ This discussion applies to pension plans for Ontario’s teachers, public service employees, provincial government employees, and employees of the various Ontario municipalities.

⁵⁰ As sole sponsor of these plans, Ontario owed these pension obligations. Investing in provincial debt was effectively a journal entry between two government accounts.

⁵¹ For example, the active-to-annuitant ratio for the Ontario Teachers’ Pension Plan decreased from 10:1 in 1970 to 4:1 in 1990.

⁵² Robert Nixon became Minister of Finance when the Liberals came into power in Ontario in 1985 for the first time since World War II. He later became Deputy Premier of Ontario in 1987, holding both positions until 1990.

⁵³ These led to the Coward, Rowan, and Slater Reports.

⁵⁴ Generally, this meant equal representation on pension boards by employer and plan member representatives.

⁵⁵ Sponsor and member contributions were increased by one percentage point each.

⁵⁶ Previously, benefit levels were determined by the legislature without the direct input of labor unions.

⁵⁷ The Ontario Municipal Employees Retirement System (OMERS) already existed as a standalone entity.

⁵⁸ The Teachers’ Pension Act of 1990 placed OTPP under joint sponsorship of the Ontario Ministry of Education and the Ontario Teachers’ Federation, the Ontario Public Service Employees Union Pension Act of 1994 placed OP Trust under joint sponsorship of the Government of Ontario and the Ontario Public Service Employees Union (OPSEU), and the Ontario Municipal Employees Retirement System Act of 2006 placed OMERS under joint sponsorship of various government entities, including the Association of Municipalities of Ontario and unions representing municipal workers across the province. OPB, governed pursuant to the Public Service Pension Act, remains under the sole sponsorship of the Ontario government. Further reforms occurred in later years. For example, in the aftermath of the Global Financial Crisis, OTPP made inflation indexation contingent on plan surpluses.

⁵⁹ Ontario Budget, 1989.

⁶⁰ The Ontario Nurses’ Association, the Canadian Union of Public Employees, the Ontario Public Service Employees Union, and the Service Employees International Union. Unlike the other Ontario pension plans, HOOPP has never been under government sponsorship (some of its employers are private sector entities). HOOPP was – from the start – an industry-wide pension plan and centralized pension administration is a fundamental aspect of its design. Before 1993, the OHA was the plan’s sole fiduciary. HOOPP’s restructure under joint sponsorship was the result of a decision of the Ontario Divisional Court.

⁶¹ Contributions were, until 1981, commingled with other government funds in a General Revenue Fund and lent to the province in the form of non-marketable debentures. Then the government established a reserve fund for the six public sector plans. This fund was not segregated between the various pension plans until the reforms of the early 1990s, described below. The Teachers’ plan was different from the others in that teacher contributions (though not those of the government or school boards) were funded into a segregated account and actively invested, rather than being lent to the provincial government. Plans were statutory, requiring legislation to change their terms and they were under the sole sponsorship of government. Cost of living adjustments were granted routinely but on an ad hoc basis and without adequate funding. The government felt comfortable operating on this basis due to growing royalties from provincial oil reserves. The informal nature of COLAs was of concern to unions and securing strong controls over these adjustments goes a long way to explaining their willingness to share risk, as discussed below.

⁶² In Alberta, reforms were undertaken between 1988 and 1993.

⁶³ The oil price shock of the 1970s had a significant – and positive – impact on Alberta’s economy and on its public pension funds. The province benefited from strong economic growth and immigration. In 1970, real household disposable income per capita in Alberta was very similar to that across Canada as a whole. By 1980, Alberta’s real

household disposable income was 20% higher than that in the rest of Canada (Statistics Canada, Long-run provincial and territorial data, Table 36-10-0229-01, see <https://doi.org/10.25318/3610022901-eng>).

⁶⁴ In 1988, contributions were capped at 18% of payroll.

⁶⁵ Archibald “Dick” Johnston and his successor, Jim Dinning (both Progressive Conservatives).

⁶⁶ Notional earnings on historical contributions were determined, in order to calculate accumulated reserves and liabilities were calculated by actuaries. The full extent of funding gaps became evident.

⁶⁷ Specifically – employees of the provincial government and its Crown agencies, local authorities, police, university professors and health sector workers.

⁶⁸ Initially primarily in bonds. Importantly, this office was centralized for all Alberta pension plans unlike in Ontario where each of the large pension plans established its own investment office. This was because the investment office was established initially to manage provincial reserves. Initially called the Investment Management Division of Alberta Treasury, it later became AIMCo.

⁶⁹ From 75% to 60% of inflation.

⁷⁰ This outcome resulted from the relative negotiating positions of government and employee representatives. The latter were keen to secure governance rights and some degree of control over benefits including indexation. In return for this, they agreed to fund a significant portion of unfunded liabilities (with an extensive amortization period). In the case of the Public Service Pension Plan, contributions were shared equally between the government, as employer, and the plan members. Each of the Special Forces, Local Authorities, and Universities Academic (UAPP) plans entered into a unique arrangement with the government, which is not the employer of any of these plans. The relative size of the unfunded liability of the Management Employees plan, was substantial so it was separated into two – one portion for retirees and the other for active members. A similar agreement was reached with the Alberta Teachers’ Association to eliminate the unfunded liability in the Teachers’ Retirement Fund (see Layton-Brown, 1998, pp 242-243). This plan was found to be significantly underfunded – with a funding ratio well below 50%. As a result, the period of amortization of the unfunded liabilities was set to 60 years. As part of the 1993 reforms, it was bifurcated into two, for pre- and post-1993 service, with separate asset pools for each. The former eventually converted to a PAYGO structure. Among the Alberta plans, only the Police plan is unlikely to have its liabilities fully amortized by the end of the amortization period (36 years from 1993), so the government will likely have to fund the residual shortfall. The UAPP was restructured as a contractual plan, independent of government, controlled by a trustee board.

⁷¹ Public sector plans were generally exempt from these standards until the enactment of the 2018 legislation.

⁷² See Exhibit 4.

⁷³ The growth rate in the number of both active members and annuitants was higher in Canada than in the U.S. over this period.

⁷⁴ The authors are grateful to Malcolm Hamilton for suggesting this illustration.

⁷⁵ Comparing employee contribution levels between the two countries and indeed between any two pension systems has limitations. Since pension benefits are a form of compensation, any portion of the cost of the benefit that is borne by employers should, from an economic perspective, be viewed as a form of compensation. Hence, a complete comparison would incorporate compensation, benefit, and contribution levels.

⁷⁶ This down payment may be reduced by investment gains or will necessarily increase due to investment losses.

⁷⁷ Obviously a more complete evaluation of this assertion would consider a relative cost-of-living assessment. Not shown, but evident in our dataset is that teacher pension systems in both countries have the highest benefit levels.

⁷⁸ Unable to reduce costs associated with existing workers, pension systems in some states have resorted to placing new hires in specific tiers with weaker benefits. Sometimes these new workers are offered only defined contribution plans. The latter is deleterious to the defined benefit pension fund as the entire construct of pension solvency is based on pooled risk, where new workers help fund the payments due to retired workers. For a comprehensive discussion of the advantages of defined benefit pension systems relative to defined contribution systems, see Healthcare of Ontario Pension Plan, 2018.

⁷⁹ New Brunswick’s pension regulations approach those in the Netherlands. It uses the term “target benefit” to describe shared risk.

⁸⁰ Bauslaugh, 2019 argues that benefits are contingent on funded status and if they “... get too far ahead of the assets and the agreed fixed rate of contributions, the trustees have a fiduciary obligation to consider reducing accrued benefits to bring the assets and liabilities back into balance.”

⁸¹ In a small number of states, pensions are considered gratuities with very limited protection. In others, pensions are encapsulated in state constitution. Some states interpret pensions under contract law and others under property rights law. Even when a contract exists or is deemed to exist, there is inconsistency in interpretation of the date on which the contract is deemed effective – whether at the time of retirement or dating back to the start of employment (the

so-called “California Rule”). This uncertainty makes it extremely difficult for state and local governments to amend pension plan terms in most cases. For a comprehensive discussion of this topic, see Monahan, 2010. In Canada, pension benefits are considered deferred wages.

⁸² This is not uniformly the case. It is common in certain plans for the employer contribution to be one percentage point above that of employees. For example, within the province of Alberta: for Alberta Teachers’, contributions of both members and employers are 8.68%, for LAPP, members contribute 8.39% of salary up to a limit, while employers contribute 9.39%, contribution rates are equal for PSP, while for MEPP rates are 12.8% for members and 13.2% for employers.

⁸³ Refer to Exhibit 9. The average plan member contribution rate for the U.S. pension funds in our dataset in a report published by the National Association of State Retirement Administrators is 7.24%. See: <https://www.nasra.org/files/Issue%20Briefs/NASRAContribBrief.pdf>.

⁸⁴ An important factor is that employer contributions in the U.S. are not uniformly funded, while those in Canada are. The data in Exhibit 13 are calculated based on actual contributions, not actuarially determined contributions. If U.S. pension plan sponsors were to fund what they are expected to, the ratio of employee-to-employer contributions evident in Exhibit 9 would be even more distorted between the countries. According to one study, funding of contributions in 2017 was as low as 36% in one state, see Pew Charitable Trusts, 2019.

⁸⁵ Corporate pension accounting in both countries is more conservative and mandates the use of a corporate bond rate, typically considerably lower than the discount rate used by public sector plans. There is an active debate about the correct approach to valuing public pension liabilities. One side of the debate argues that since pension liabilities are certain obligations, they should be discounted at close to a risk-free rate. The other side argues that public pension systems are going concerns and their liabilities cannot easily be offset in the market and so should be valued based on the future cost of funding. This is called “level funding” and it is the approach followed by the Government Accounting Standards Board in the U.S. and by Canadian pension plans. GASB 67 restricts the use of expected returns in certain circumstances. See Lipshitz and Walter, 2019 page 6.

⁸⁶ The typical U.S. discount rate of 7.2%, a 1.3% risk free rate, and a 2.2% inflation expectation implies a risk premium of 3.7%.

⁸⁷ On a trailing five-year basis, investment performance for pension plans in the two countries is relatively similar and well above discount rates; that is largely due to the time period. On a trailing ten-year basis, there is divergence in investment performance, with all U.S. plans performing below their discount rate. What is more important, of course, is expectations for future performance and many market observers believe future returns are unlikely to be at the levels achieved in the decade through December 2018.

⁸⁸ Over-estimating funded status means that plan actuaries recommend lower levels of current contributions than would otherwise be necessary in order to ensure pension solvency. When this occurs over many years – as it has – the effect compounds.

⁸⁹ This is not to suggest that comparing discount rates between countries is entirely appropriate, for there are numerous factors that influence expected portfolio returns, among which is the effect of currency.

⁹⁰ Canadian plans typically retain the services of the largest actuarial firms whereas U.S. plans generally use smaller or regional firms as the largest firms tend not to offer services to public sector pension plans.

⁹¹ Some pension plans incorporate “adverse deviation provisions” to warrant discount rates that essentially allow them to set aside surpluses.

⁹² The large Canadian plans rarely use investment consultants, while the smaller ones use consultants for periodic asset allocation studies.

⁹³ Specifically, the actuary opines on the reasonableness of the assumptions as measured by a minimum 25% likelihood that the investment target will be achieved.

⁹⁴ Although HOOPP and OMERS preceded OTTP as independent investment organizations, their current models date to after the formation of OTTP. CDPQ, established concurrent to QPP in the 1960s was, from inception, an investor in markets. It has invested in equities since 1967 and in private equity since 1971 (World Bank, 2018).

⁹⁵ The evolution of OTTP was discussed in a fireside chat at the Ivey Business School Awards Dinner Wednesday October 3, 2007 between then CEO Claude Lamoureux and then CIO Bob Bertram.

⁹⁶ OTTP’s founding chairman, former Bank of Canada governor Gerald “Gerry” Bouey, recruited Lamoureux, a former MetLife executive, as President and CEO, a position he held until his retirement in 2007.⁹⁶

⁹⁷ Lamoureux cited as an influence a book by Keith Ambachtsheer: Ambachtsheer, Keith. 1986. *Pension Funds and the Bottom Line: Managing the Corporate Pension Fund as a Financial Business*. Dow Jones-Irwin. Homewood, IL.

⁹⁸ These bonds were priced off the debt of Ontario Hydro. Outside of Québec, that was typical of all of the other public pension plans in Canada at the time.

⁹⁹ Unable to sell the debentures, it used swaps and futures to obtain equity exposure.

¹⁰⁰ CPPIB has today by far the largest investment organization in Canada. Its staff has grown from 15 at the time of inception (Vittas et al, 2018) to 1,661 at the end of fiscal 2019.

¹⁰¹ OTPP established Teachers' Private Capital to invest in private equity. It also established an infrastructure capability. OMERS Infrastructure, formerly Borealis Infrastructure, dates to 1999.

¹⁰² OTPP took a 20% stake in real estate company, Cadillac Fairview in 1995, then acquired the business outright in 1999, giving it control of about one hundred properties and specialist staffing. Oxford Properties Group, established in 1960, was acquired by OMERS in 2003. CDPQ acquired real estate firm Ivanhoe Cambridge in 1990 and established CDPQ Infrastructure as a standalone unit in 2015. BCI acquired a property portfolio and a team of professionals from Bentall Kennedy in 2016 to form the basis of its QuadReal real estate organization.

¹⁰³ While most of the other large Canadian pension plans have foreign offices, HOOPP operates exclusively from its Toronto office.

¹⁰⁴ Insourcing investment activity has its limits. As one pension leader articulated to the authors, outside managers make sense – (i) where there is a cost advantage (especially where the strategy is a niche approach that would not warrant an internal team); (ii) in the case of a transient activity such as an opportunistic investment opportunity; (iii) for a new strategy that the pension fund may wish to learn about from others before insourcing, such as a new asset class or geography; and (iv) to facilitate access to exceptional investors.

¹⁰⁵ Remuneration formulas are disclosed to ensure transparency. Compensation terms for investment staff of the Canadian pension investment organizations follow a similar template comprising three components: base salary, and short- and long-term incentives. The incentive components are determined by applying a salary multiplier to medium-term and long-term investment performance, respectively (Ambachtsheer, 2011). Lamoureux played a critical communication role winning over unions and journalists to the efficacy of market-rate compensation. Across Canada, public sector officials as well as labor unions reconciled themselves to relatively high levels of compensation. The former had already staked their reputations on pension reforms being successful, the latter were economically incentivized to see strong investment performance.

¹⁰⁶ The Yale Endowment is very different from a public employee pension fund, notably in terms of the need for ongoing cash flows to support beneficiary disbursements as opposed to a heavy focus on long-term capital appreciation.

¹⁰⁷ There is a difference between pure scale effects (the impact of increased size, all else remaining the same) and operating efficiency (differences in efficiency between public pension funds of the same size). This distinction is important, since the performance and strategy implications are materially different.

¹⁰⁸ Conceptually, larger funds should be able to establish internal investment capabilities which could achieve investment returns better matched to their liabilities, and when engaging with external fund managers they should be able to establish customized accounts to achieve that same objective.

¹⁰⁹ HOOPP, for example, has a liability-driven strategy with heavy use of derivatives and leverage that has enabled it to achieve superior investment returns. OTPP and OMERS have established very large direct investing platforms active around the world.

¹¹⁰ Two very large investment funds – Japan's Government Pension Investment Fund and Norway's Government Pension Fund Global – have struggled with whether and how to establish private market investment programs that make sense at scale. During consultations about the design of CPPIB, there was discussion about whether the portfolio should be managed as a single pool or broken into smaller separate funds (the argument being that separate funds would promote competition and that a large fund might exert too much influence on the Canadian economy, see Little, 2008, page 170). Additionally, the largest pension funds compete for investment opportunities with sovereign wealth funds that do not have to meet discount rate hurdles and hence have lower cost of capital.

¹¹¹ This is an imperfect measure since what really matters is net investment returns, not the spread between gross and net returns. Some pension funds achieve higher returns by compressing the spread between gross and net returns. Others "purchase" net returns by incurring higher investment costs. HOOPP typifies the former. It neither allocates assets extensively in private markets nor allocates to external fund managers. Cross and Emes, 2016 find it to have the lowest expenses in their sample, at 23bps. OMERS, by contrast, invests extensively in private markets, managed 91.3% of its portfolio internally at the time of that analysis, and reported investment expenses of 58bps. OPTrust, smaller than these two plans, had an expense ratio of 89bps. This small sample suggests some benefit to scale. Of course, focusing on expenses without looking at investment returns is only half the picture. Cross and Emes do not consider investment returns in their analysis.

¹¹² This includes administration of contributions, paying benefits, and interactions with active and retired plan members. Unless a pension fund is either very small or inefficiently managed, there is unlikely to be opportunity for cost savings, so the scale benefit is likely to dissipate with size.

¹¹³ External managers charge management fees, levied on assets under management, and performance-related fees levied on the value-add that the fund manager provides its client. Larger pension funds generally negotiate lower fees in line with their larger fund commitments. Moreover, they can more easily obtain access to low-fee or no-fee co-investments from investment managers.

¹¹⁴ The qualifier is important because at the extreme, two plans with very simple portfolios invested solely in index funds should evidence expense ratios not correlated to size.

¹¹⁵ Disclosure of investment expenses is inconsistent and incomplete in the reporting of both U.S. and Canadian pension funds. External fund management fees are almost always fully disclosed, but performance-related expenses are rarely disclosed by pension funds in either country. Very few pension funds disclose costs associated with their internal investment teams.

¹¹⁶ The sample set includes CPPIB, OTPP, OMERS, HOOPP, and OPB (all in our survey) as well as OPTrust, a smaller plan.

¹¹⁷ Moreover, they observe that CPP's reported expenses do not include administrative costs of processing pension benefits as these are incurred by the government of Canada and deducted from contributions made to CPPIB.

¹¹⁸ They argue that a sample set of six is inconclusive, the study relies on incomplete and non-comparable publicly-reported data (whereas their own dataset "in a best efforts basis... attempts to standardize investment cost information"), and logic – comparing CPP's administrative expenses to its AUM "makes no sense as the CPP is only 17% funded."

¹¹⁹ This study draws on expense data reported to CEM Benchmarking, specifically from 449 pension plans across the world with assets values ranging from \$100 million to \$1 trillion.

¹²⁰ "The price of a pension: Inside CPPIB, the \$3-billion-a-year operation that invests your money," David Milstead, *Globe and Mail*, September 7, 2019.

¹²¹ Referred to in Canada as "Crown corporations."

¹²² Effective 2021, Alberta's public pension funds will all be mandated to use AIMCo (prior to 2019 legislation, this did not apply to the Teachers' Retirement Fund). That is not the case in British Columbia where public pension funds are not required to use BCI.

¹²³ AIMCo and BCI each have 31 clients – customizing portfolios within asset classes for each client would come at a cost of losing much of the benefit from scale. As an illustration: AIMCo changed its infrastructure benchmark from equal weighting between real return bonds and the MSCI AWCI, to CPI+450bps. Different clients were seeking different objectives from this asset class, but with 31 clients, it would have been very complex for AIMCo to create completely customized portfolios.

¹²⁴ Its full name is the Colleges of Applied Arts and Technology pension plan.

¹²⁵ CAAT is registered in Ontario and can serve pension clients across Canada.

¹²⁶ <https://www.cbc.ca/news/canada/manitoba/pallister-public-pension-fees-1.5398291>.

¹²⁷ <https://www.ai-cio.com/news/pennsylvania-inches-closer-forming-new-83-billion-state-investment-office/>.

¹²⁸ <https://www.chicagotribune.com/politics/ct-illinois-municipal-pension-consolidation-20191218-v7feag3lsfez5irczyq7ba4cha-story.html>.

¹²⁹ To ensure comparability, we have applied a uniform discount rate of 6% to all pension liabilities. A common discount rate will show a better than reported funded status for pension plans with discount rates below 6% (the Canadian plans) and a lower than reported funded status for plans with discount rates above 6% (the U.S. plans). We have assumed a duration of 15 years – a 1% decrease in the discount rate increases gross pension liabilities by 15%.

¹³⁰ An important caveat to use of a common discount rate is that we are showing funded status the way we as observers see them, not the way that investment staff view their own pension funds. A second caveat is that positive cash flows may not reflect favorable demographics, but rather an intentional need to catch up on previous funding deficits. For example, Alberta LAPP has excess contributions in order to make up for underfunding experienced following the Global Financial Crisis.

¹³¹ Only one U.S. plan in our sample has more than 20% of its portfolio in real assets.

¹³² In its purest form, a liability-driven investment strategy (LDI) matches bonds of duration and yield to the duration and interest-rate cost of pension liabilities, allowing for immunization of interest rate risk. Because public pension plans use a market-based discount rate, they can at best approximate LDI, by investing in bonds and long-duration real assets. HOOPP's portfolio comprises two parts, one of which is oriented to an LDI strategy, with long-duration and real return bonds, real estate, and infrastructure, the other is focused on absolute return strategies.

¹³³ CPPIB, which is not a liability-oriented investor, operates with a total return orientation similar to that of U.S. pension funds. Compared with the other pension funds in our sample – both in Canada and in the U.S., CPP can actually take more risk in its portfolio since, with a modified pay-as-you-go funding structure, its portfolio represents a much smaller share of the source of future funding than is the case for pension plans that depend on

their portfolio to make up negative cash flows. CPP uses a “total portfolio” methodology where each investment is assigned equity attributes and bond attributes that are optimized across the portfolio. To illustrate: CPP sees infrastructure as a “broad range of assets with very different risk/return characteristics [which] would be funded and benchmarked accordingly. For example, established assets with low earnings volatility, such as water distribution networks and toll roads, are relatively low-risk and would be funded and benchmarked primarily with fixed income components of the Reference Portfolio. On the other hand, the higher risk associated with developing and building new infrastructure would be funded from a combination of equity and debt.” See Raymond, 2009 for discussion of how CPPIB’s organizational design enables successful implementation of its total portfolio investment strategy.

¹³⁴ This statement is not universally true as U.S. pension plans invest in open-ended funds oriented to longer-duration cash flows and the larger pension funds invest directly in real estate (though only rarely in infrastructure).

¹³⁵ This statement is subject to the caveat that Canadian pension plans make more extensive use of portfolio leverage. On a net of leverage basis their equity exposure is higher than appears on a gross of leverage basis, which is the methodology used in measuring the asset allocation data in Exhibit 20.

¹³⁶ Besides for yield, pension plans also generate cash by holding liquid instruments or making use of secondary markets to liquidate private market investments. Both place downward pressure on investment returns.

¹³⁷ In the range of 30-40%.

¹³⁸ HOOPP has leverage of more than 50%, see https://hoopp.com/docs/default-source/investments-library/annual-reports/2018-hoopp-annual-report-final.pdf?sfvrsn=69b5e981_12. It has gross exposure of 70% to long-duration bonds.

¹³⁹ When OTPP was restructured, its entire portfolio comprised non-marketable Ontario debentures. Using derivatives, it built up an equity portfolio. HOOPP initially used derivatives to obtain exposure to foreign markets without triggering caps on foreign investment rules. It used derivatives to hedge exposure to a concentrated position in its Canadian equity portfolio during the runup of the dot com market, then to bifurcate beta and alpha in its large cap domestic equity portfolio. Following the bursting of the dot com bubble, it began to use derivatives to hedge unexpected moves in interest rates and inflation and as a fundamental part of its liability-driven investment strategy. It is today among the largest users of derivatives in the world.

¹⁴⁰ The risks of complex strategies were borne out when one Canadian pension investor incurred a substantial loss on a volatility trade gone wrong during the market volatility in March-April 2020.

¹⁴¹ In 2018, the average public equity allocation of Canadian plans to foreign markets was 30.4%, while it was only 6.2% to domestic markets (calculated for the eight plans in our dataset that report equity investments disaggregated by geography).

¹⁴² Each pension fund develops a portfolio to address its combination of funded status, cash flows, and constraints. Thus, pension plans should be measured against their particular portfolio needs, not with each other. Across borders, foreign exchange complications are introduced.

¹⁴³ The Canadian dollar depreciated against the U.S. dollar by 28.4% over the five-year period and by 11.9% over the ten-year period (source: Federal Reserve Economic Data/FRED) explaining a significant portion of the variance in investment performance.

¹⁴⁴ A factor explaining investment performance between these two years is that Canadian plans generally have December year-ends, while U.S. plans generally have June year-ends.

¹⁴⁵ See <https://www.slge.org/assets/uploads/2019/09/funding-brief-oct2019.pdf>.

¹⁴⁶ As articulated in an April 28, 2020 Issue Brief of NASUBO, the National Association of State Budget Officers, “The coronavirus outbreak has quickly upended state budgets with states now facing significant revenue declines and increased spending demands as they contend with both a public health emergency and a severely deteriorating national economy.”

¹⁴⁷ At the time of writing, there has been some discussion in the media about the role of the federal government in pension funding. Some believe that the federal government may be called upon to provide support to underfunded state and local plans – either directly or indirectly. That approach is dangerous since it establishes a moral hazard. The aggregate underfunding of pension liabilities is measured in the trillions of dollars, a burden that should not be shifted between regions (which is what is implied by federal involvement) in the absence of comprehensive reform.

¹⁴⁸ It is possible to envisage the federal government assuming a role in pension reform. This would presumably be accompanied by a series of conditions dictated by Washington.

¹⁴⁹ Small plans make up the vast majority by number if not by liabilities of pension systems.

¹⁵⁰ In Canada, by contrast, fiduciaries must also consider employer interests – treating employers as beneficiaries. Subsection 8(3) of the federal Pension Benefits Standards Act states, “The administrator shall administer the pension plan and pension fund as a trustee for the employer, the members of the pension plan, former members, and any other persons entitled to pension benefits under the plan,” see: <https://laws-lois.justice.gc.ca/eng/acts/p->

[7.01/FullText.html](#). For a discussion of the evolution of fiduciary duties in Canadian pension law, see Waitzer and Sarro, 2013.

¹⁵¹ As Lipshitz and Walter, 2019 have argued, “Pension obligations are well protected in law such that the ultimate ‘at risk’ stakeholder for public pensions is the taxpayer, not the plan beneficiary. And yet the taxpayer has no direct voice in pension governance.”

¹⁵² There have been very few municipal bankruptcies in the U.S. and when these occur, judges have discretion to prioritize considerations of equity between claimants. In two high profile cases, rights of pension beneficiaries were ruled to be superior to those of bondholders. In Stockton, CA, pension claims were preserved intact, with bondholders incurring losses. In Detroit, pensions incurred considerably less impairment than bondholders. However, Central Falls, RI emerged from bankruptcy with impairment to pensions rather than bondholders because of emergency laws prioritizing bondholder rights. For bondholders this is particularly worrying as the market for monoline municipal bond insurance was eviscerated during the Global Financial Crisis. States are not able to restructure their debts through bankruptcy, as we have already noted.

¹⁵³ There are numerous examples of governments reducing services or adding to the backlog of infrastructure maintenance because of the burden of pension expenditures.

¹⁵⁴ Benefit levels in the U.S. are determined as part of collective bargaining agreements. The downside of this approach is that negotiators on both sides are incentivized to compromise, but in so doing are not constrained by the need to ensure that the outcome leads to prudent funding. Benefit levels are often generous because elected officials are susceptible to short-term considerations in these negotiations. Bauslaugh, 2019 argues that “well-intentioned fiduciaries in a representative governance model are subject to the influence of their appointing constituencies. Union trustees are under enormous pressure to avoid any benefit reductions. Management trustees are often under considerable pressure to promote benefit improvements as a means of enabling employers to avoid current wage increases.”

¹⁵⁵ Despite legal interpretation that provides pension benefits with extremely strong protections in law, there may need to be some revision of plan benefits in order to ensure long-term pension funding sustainability. Robson and Laurin, 2014 provide two areas for reform of benefits – eliminating early retirement and switching benefits from final salary to career-average salary in order to avoid spiking. Other factors include adjustment of COLA provisions and holistic determinations of benefits and contribution levels. At the very least, there needs to be some reckoning with the most troubling aspect of pension benefits – the inability in many states even to adjust future unearned benefits for existing workers.

¹⁵⁶ Bauslaugh, 2019 suggests that probabilistic testing involving dispassionate experts (including expert trustees) be incorporated in the negotiation processes. He cites the example of New Brunswick, where mandatory benefit reductions kick-in if an independent actuary determines that plan assets and contributions do not support plan solvency.

¹⁵⁷ As we have argued above, from an economic perspective, any portion of pension benefits that is contributed by employers should be viewed as a form of compensation. This portion is clearly higher for U.S. public sector workers than it is for their Canadian peers.

¹⁵⁸ The federal plans as well as some provincial plans such as the Management Employee Plan in Alberta and OPB in Ontario remain under government sponsorship.

¹⁵⁹ This is well articulated on the OPTrust website, “OPTrust was established to give Plan members and the Government of Ontario an equal voice in the administration of the OPSEU Pension Plan and the management of the assets through joint trusteeship.” OPSEU is the Ontario Public Service Employees Union.

¹⁶⁰ Independence of government is not uniformly viewed as a positive feature if there is an implicit government guarantee for pension liabilities. Hamilton and Cross, 2018 argue that “independence is a flaw, not a virtue, of public sector pension governance. The plans take investment risk to advance the interests of plan members while the interests of taxpayers, who ultimately bear this risk, are ignored. These practices are best described as moral hazard, not good governance.”

¹⁶¹ Setting benefit and contribution levels that, when overseen in a coordinated manner, ensure plan solvency. Plan design is overseen by the plan sponsors. As we have noted, most plans discussed here are structured under joint-sponsorship. Sponsor boards also retain the right to amend or terminate the plan.

¹⁶² Administering contributions and benefits and overseeing the investment program as a fiduciary.

¹⁶³ https://www.omers.com/About-OMERS/OMERS_Governance.

¹⁶⁴ It sets benefit and contribution levels including the apportioning of contributions between employers and employees.

¹⁶⁵ It is responsible for determining the discount rate and the adequacy of plan design features selected by the Sponsors Corporation. In Ontario, pension administrative/fiduciary boards must be comprised at least 50% of active plan members.

¹⁶⁶ By way of contrast, HOOPP's structure is one of unicameral governance, with a single board.

¹⁶⁷ Public pension plans in the U.S. are government-sponsored, with state and local governments and special-purpose public entities having full control over plan terms and full responsibility for ensuring plan solvency. Because benefits promised to plan members are generally considered to be inviolable under the patchwork of U.S. pension legislation, one might expect taxpayers to have a voice in public pension design and governance, since they are ultimately the backstop for pension solvency. That voice is very faint. Trustees (both government-appointed and certainly representatives of public employee unions) have fiduciary duties exclusively to plan beneficiaries, not to taxpayers.

¹⁶⁸ In simple terms, the current U.S. model can be viewed as paternalistic in that employees have neither influence nor shared responsibility for ensuring solvency.

¹⁶⁹ In order to ensure transparent decision-making, many U.S. pensions have open board meetings. Transparency might be positive if it surfaces transactions that violate market benchmarks in return for payments in cash or in kind, including political campaign contributions. But it could also result in overly conservative decision-making if board members are later held to account for losses associated with otherwise reasonable investment strategies.

¹⁷⁰ For example, many states require investment managers soliciting business from pension plans to register as lobbyists in the sponsoring jurisdiction. This in addition to standard licensing as securities representatives.

¹⁷¹ For example, CPPIB's governing law requires "a sufficient number of directors [to have] proven financial ability or relevant work experience to enable the Board to effectively achieve its objectives" (Canada Pension Plan Investment Board Act, Section 10(4)(a)(ii)). OTPP typifies the structure for employment-related plans, with a board comprised of an equal number of representatives of the Ontario Ministry of Education and the Ontario Teachers' Federation, and with a board chair selected by other trustees. OTPP and OMERS have requirements for professional boards. By contrast, the provincial pension plans in Alberta and British Columbia do not, nor does HOOPP. Among the investment management organizations, AIMCo, CDPQ, IMCO, and PSP have expert boards, BCI does not.

¹⁷² The need is more urgent for government representatives. In both countries, union representatives tend to have longer tenures (as much as 20 years) whereas government representatives typically have terms of three years, with a finite number of renewals.

¹⁷³ We have described similarities between Ontario and Alberta. Alberta and British Columbia, as contiguous provinces, have attempted to conform their pension legislation.

¹⁷⁴ For example, this has been the case in Ontario since the 1965 enactment of the original Pension Benefits Act.

¹⁷⁵ Notably, OTPP and OMERS.

¹⁷⁶ Moreover, they are not subject to regulations of the Employee Benefits Security Administration and their obligations are not insured by the Pension Benefit Guaranty Corporation.

¹⁷⁷ ERISA Section 3031.

¹⁷⁸ Pension Task Force Report on Public Employee Retirement Systems, 1978 as further cited in Report of the Committee on Education and Labor, U.S. House of Representatives on H.R. 4928, 1982.

¹⁷⁹ There were efforts in the early 1980s in the form of the proposed Public Employee Retirement Income Security Act (PERISA) and Public Employee Pension Plan Reporting and Accountability Act (PEPPRA). Both of these met with opposition. For Senate discussion of PERISA, see Pension Reform for State and Local Employee Retirement Systems, 1982.

¹⁸⁰ The Uniform Management of Public Employee Retirement Systems Act is a uniform template that has not been widely accepted, see:

<https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=b02cb5c8-7df1-8214-1379-069ff3f6cad6>.

¹⁸¹ While we need to look to the mistakes of the past, we cannot go back to the past. The reality is that early taxpayers and plan members got a free ride at the expense of current and future taxpayers and future plan members.

¹⁸² IMCO was formed de novo for this purpose. CAAT Pension was also reformulated as such an organization, although it is not a public sector plan manager.

¹⁸³ There are numerous examples of infrastructure consortia – including OMERS Infrastructure's Global Strategic Alliance and several similar partnerships in the UK. IFM Investors manages portfolios of its owners, a consortium of Australian superannuation funds, as well as that of pension funds in other countries.

¹⁸⁴ Serving U.S. clients might reduce investment costs for Canadian clients if investment fees were rebated to them. Certainly, this would entail complications. As currently structured, none of the organizations is authorized to serve clients outside its geographic area. Additionally, scale effects begin to diminish at very large scale, so if these

organizations were to focus on U.S. portfolios, their domestic clients and government sponsors might argue that investment returns would reduce on each marginal dollar of assets. Canadian pension plans and taxpayers may be averse to dilution of focus away from domestic clients. Meanwhile – in the U.S., there would predictably be arguments from investment management firms that this approach is unfair social competition (in the form of a lower-cost public sector organization competing with the private sector). Nevertheless, this may be an idea worth exploring.

¹⁸⁵ Investment consultants advise on portfolio mix and selection and review of investment funds. Actuaries advise on plan design.

¹⁸⁶ In the model described by Bartholomew et al, 2018.

¹⁸⁷ There is some degree of conflict in that investment consultants need to balance client relationships with the need to maintain relationships with investment managers whose funds they select for multiple client portfolios. This is compounded since many consultants have become investment managers themselves, offering outsourced portfolio management services.

¹⁸⁸ Reforms may have been easier to implement in Canada than would be the case in the U.S. Marmor and Maioni, 2009 attribute divergent evolution of pension and healthcare systems in the two countries to their political systems. They argue that Canada's parliamentary system, which integrates executive and legislative powers, allows for "more coherent development of policy initiatives," and reduces the degree to which "organized interests can block. . . legislative process[es]."