OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
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Analysis of Active versus Passive Management of Canadian Public Pension Plans

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The Parliamentary Budget Officer (PBO) supports Parliament by providing economic and financial analysis for the purposes of raising the quality of parliamentary debate and promoting greater budget transparency and accountability.

The purpose of the report is to provide analysis on the performance of actively managed federal public pension funds, specifically the funds managed by the Canada Pension Plan Investment Board (CPPIB) and the Public Sector Pension Investment Board (PSPIB), and to compare the returns to that of a passive management strategy.

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Executive Summary

In response to parliamentary interest, PBO analyzed the investment performance of the Canada Pension Plan Investment Board (CPPIB) and the Public Sector Pension Investment Board (PSPIB). More specifically, the objective was to determine whether their active management strategy resulted in higher returns compared to a passive strategy, once additional management costs related to active management were netted out.

Active management can be defined as trying to achieve higher returns by identifying investments which will outperform a chosen benchmark. This is usually accompanied by higher complexity and additional personnel costs.

Passive management tries to mimic a certain benchmark or index, with the goal of achieving the same or very similar returns.

PBO's analysis compares the actual returns of the CPPIB and the PSPIB, both of which use active management strategies, to that of a customized passive portfolio. It spans from 2006-07 until their most recent annual reports (2018-19 for the CPPIB and 2017-18 for the PSPIB). All transaction costs and management fees associated with actively managing the funds were netted out from the annual returns, while operating expenses were assumed to be the same under either approach for both the CPPIB and the PSPIB.

The passive portfolio was constructed using two large public equity and fixed income indices. The baseline scenario for the passive portfolio used a weight of 70 per cent equity and 30 per cent fixed income. PBO also performed a sensitivity analysis on the weights allocated in the passive portfolio, with a higher (85 per cent) and lower (55 per cent) portion allocated to equity.

In all three scenarios, the CPPIB's actual net returns outperformed the returns of the passive strategy. For the baseline scenario, total net assets under management at the end of the period were $48.4 billion higher than they would have been under the passive strategy, which represents an average additional annual return of 1.2 per cent. For the higher and lower equity weighting scenarios, total net assets under management at the end of the period were $31.5 billion and $66.7 billion higher, which accounts for an average additional annual return of 0.6 per cent and 1.8 per cent, respectively.

The PSPIB's actual net returns were roughly the same as the returns of the passive strategy. For the baseline scenario, total net assets under management at the end of the period were $1.7 billion higher than they would have been under the passive strategy, which represents an average additional annual return of 0.3 per cent. For the higher and lower equity scenarios, total net assets under management at the end of the period were $6.1 billion lower and $9.8 billion higher, which accounts for a lower average annual return of 0.4 per cent and a higher average annual return of 0.9 per cent, respectively.

1. Introduction

As part of the office's mandate, PBO may prepare reports on matters of particular significance relating to the nation's finances or economy that are listed in an annual work plan.[1] In response to parliamentary interest, PBO decided to undertake an analysis on the performance of federal public pension funds, specifically the funds managed by Canada Pension Plan Investment Board (CPPIB) and the Public Sector Pension Investment Board (PSPIB).

The scope of the analysis is to compare the performance of these funds under an active management strategy, to that of a completely passive strategy. The objective is to determine whether the additional costs associated with the active strategy have resulted in higher net returns.

At a high level, passive management refers to trying to mimic a benchmark or an index, with the goal of achieving the same or very similar return. Active management tries to achieve higher returns by identifying individual investments which outperform the benchmark. Given that active management requires more personnel to conduct the required research, and also involves more transactions, this strategy comes with increased complexity and additional costs. The goal is that in the long run, after netting these costs, the strategy will achieve a higher return than an identified benchmark.

1.1. Background

The CPPIB was established in 1997 under the *Canada Pension Plan Investment Board Act*, with the responsibility to ensure the long-term sustainability of the Canada Pension Plan (CPP). It is accountable to both Parliament and federal/provincial finance ministers; however, it operates at arm's length from federal and provincial governments.[2]

The PSPIB was created under the *Public Sector Pension Investment Board Act,* which came into force in 1999. The role of PSPIB is to invest the contributions of both employees and the employer for the funding of pension benefits earned after April 1, 2000. This includes the pension plans of the federal public service, the Canadian Forces, the Royal Canadian Mounted Police, and the Reserve Force (starting March 1, 2007). PSPIB also operates at arm's length from the federal government.[3]

The statutory mandates of the CPPIB and the PSPIB are similar, as they both seek to:[4] [5]

- Invest in the best interest of the contributors and beneficiaries;

- Maximize long term returns without taking on undue risk of loss, while considering the funding and requirements of the plans[6]; and,
- Ensure the ability to meet their financial obligations.

Both the CPPIB and the PSPIB have implemented and currently use an active management strategy, with the purpose of achieving higher returns, over the long term, without taking on undue risk.[7]

2. Analysis

PBO's analysis compares the actual returns of the CPPIB and the PSPIB, both of which use active management strategies, to that of a customized passive portfolio. The analysis spans from 2006-07, which is when the CPPIB started to implement its active management strategy (the PSPIB began initiating active management programs in 2001-02[8]), until their most recent annual reports. The CPPIB has published its 2018-19 annual report, while the PSPIB's most recent is for the 2017-18 fiscal year.

The analysis looks at the overall returns and increase in total assets under management using both strategies. The returns under the active strategy are actuals reported in their annual reports and are net of active management investment costs.

The passive strategy used in this analysis consists of a simple portfolio with two asset classes. It was constructed using the returns from the same indices for equity and fixed income as those currently used by the CPPIB in its benchmark portfolio.[9] The indices are:

- For Equity, the S&P Global LargeMidCap Index; and
- For Fixed Income, the FTSE TMX Canadian Governments Nominal Bonds Index.

For the construction of the passive portfolio, PBO used a weight of 70 per cent equity and 30 per cent fixed income. This is similar to the ratio used in the PSPIB's passively managed Reference Portfolio.[10] The CPPIB used a similar ratio in its benchmark in 2015-16. However, it subsequently moved toward increasing the weight in equities, with the target of reaching 85 per cent equity in 2019-20.[11]

Given this shift, PBO also conducted a sensitivity analysis on the returns of the passively managed portfolio using different weights, which is shown in the Results section of this report.

2.1. Methodology

PBO's analysis started in the 2006-07 fiscal year, using the beginning balance of net assets under management for both funds. During the fiscal year, the investments generate returns which increase assets under management, in addition to net contributions from their contributors and beneficiaries. Netting out costs associated with active strategies results in a new balance for the net assets under management at the end of the fiscal year. This process was repeated for each subsequent fiscal year until their most recent annual report.

The performance of the active management strategies was based on the actual return data provided in both funds' annual reports. All transaction costs and management fees associated with actively managing the funds were netted out from the annual returns. Operating expenses, which may be indirectly linked to active management, were removed from both the active and passive returns, as PBO was unable to identify the percent of these costs due only to active management.

PBO made several assumptions regarding the passively managed portfolio. The assumptions included:

- The baseline portfolio would have a weight of 70 per cent invested in the equity index and 30 per cent invested in the fixed income index[12];
- No significant transaction costs are associated with the passive strategy;
- In-year contributions to the funds would be the same under both strategies; and,
- Given that contributions occur throughout the year, an investment return was calculated on half of the annual contribution amounts.

PBO conducted a sensitivity analysis on the passively managed portfolio, using different weights for equities and fixed income. PBO calculated the total net assets at the end of the period had an additional 15 per cent been allocated to the equity index or fixed income index.

3. Results

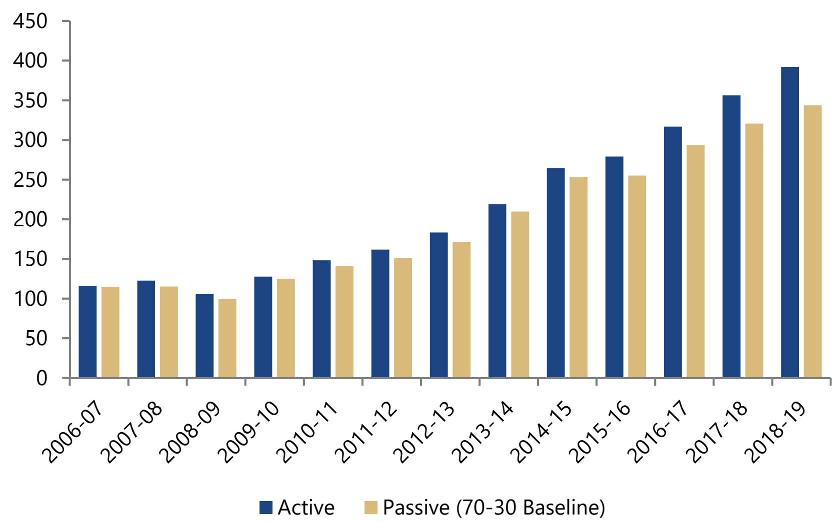
3.1. Canada Pension Plan Investment Board

At the beginning of 2006-07, the CPPIB had $88.5 billion in net assets under management. This has increased to $392.0 billion at the end of 2018-19, which is the combined result of net annual CPP contributions and net investment returns achieved using an active management strategy.

Based on the methodology described in the previous section, PBO calculated the total net assets under management had they invested in a passive portfolio. As shown in Figure 3-1, under the baseline scenario, the total net assets at the end of 2018-19 would have been $343.6 billion. Therefore, the CPPIB's actual portfolio outperformed the passive portfolio by $48.4 billion over the entire period, while the average annual return was 1.2 per cent higher under the active strategy. This takes into account the difference in management costs of an active strategy compared to the lower cost of a passive strategy.

Figure 3-1 CPPIB Net Assets

$ billions



Sources: CPPIB's Annual Reports and PBO Calculations.

Notes: Figures for the net assets are as of the end of the fiscal year.

PBO calculated the return for the passive portfolio using the annualised returns of the S&P Global LargeMidCap Index and the FTSE TMX Canadian Governments Nominal Bonds Index.

As shown in Table 3-1, the CPPIB would have outperformed all three scenarios of the passive strategy. If the passive portfolio consisted of 85 per cent equity and 15 per cent fixed income, the total net assets under management would have been $360.5 billion by the end of 2018-19, which is $31.5 billion lower than its actual balance of $392.0 billion. If the ratio was 55 per cent allocated to equity and the remaining to fixed income, the end of year balance in 2018-19 would have been $325.3 billion, which is $66.7 billion lower than its actual balance. For both scenarios, the average annual return for the active strategy was 0.6 per cent and 1.8 per cent higher, respectively.

PBO also calculated the variance of returns for each scenario for the CPPIB.[13] The variance provides an indication of the level of risk, or volatility of returns, relative to the average return. As shown in Table 3-1, the CPPIB's active strategy had a lower variance than the baseline passive portfolio and the higher-weighted equity portfolio, but higher than the lower-weighted passive portfolio.

Table 3-1 CPPIB Sensitivity Analysis

($ billions)	**2006-07**	**2018-19**	**Variance**
Active (Actual)	115.9	392.0	0.9%
Passive (70-30 Baseline)	114.6	343.6	1.2%
Passive (85-15)	116.0	360.5	1.8%
Passive (55-45)	113.2	325.3	0.7%

Sources: CPPIB's Annual Reports and PBO Calculations.

Notes: Figures for the net assets are as of the end of the fiscal year.

PBO calculated the returns for the passive portfolios using the annualised returns of the S&P Global LargeMidCap Index and the FTSE TMX Canadian Governments Nominal Bonds Index.

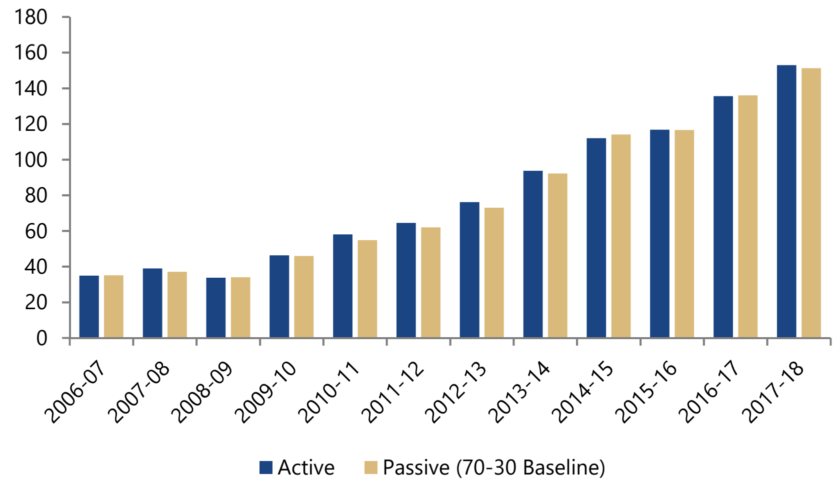
3.2. Public Sector Pension Investment Board

The PSPIB's net assets under management at the beginning of 2006-07 amounted to $27.6 billion. Under its active management strategy, this increased to $153.0 billion by the end of 2017-18. Like the CPPIB, this is a result of net annual contributions as well as investment returns.

Using the same methodology described above, PBO calculated the total net assets under management had the PSPIB used a passive management strategy. As shown in Figure 3-2, under the baseline scenario, the total net assets at the end of 2017-18 would have been $151.3 billion. Therefore, PSPIB's actual portfolio only slightly outperformed the passive portfolio by $1.7 billion over the entire period. This amount takes into account the lower management fees of a passive strategy.

Figure 3-2 PSPIB Net Assets

$ billions



Sources: PSPIB's Annual Reports and PBO Calculations.

Notes: Figures for the net assets are as of the end of the fiscal year.

PBO calculated the return for the passive portfolio using the annualised returns of the S&P Global LargeMidCap Index and the FTSE TMX Canadian Governments Nominal Bonds Index.

Table 3-2 identifies the net assets under management at the end of the 2017-18 fiscal year had different weights been applied to the passive portfolio.

If the passive portfolio consisted of 85 per cent equity and 15 per cent fixed income, the PSPIB's total net assets under management would have been $159.1 billion by the end of 2017-18, which is $6.1 billion higher than its actual balance of $153.0 billion. If the ratio was 55 per cent allocated to equity and the remaining to fixed income, the end-of-year balance in 2017-18 would have been $143.2 billion, which is $9.8 billion lower than its actual balance.

Table 3-2 PSPIB Sensitivity Analysis

($ billions)	2006-07	2017-18	Variance
Active (Actual)	35.0	153.0	1.3%
Passive (70-30 Baseline)	35.1	151.3	1.3%
Passive (85-15)	35.5	159.1	1.9%
Passive (55-45)	34.7	143.2	0.8%

Sources: PSPIB’s Annual Reports and PBO Calculations.

Notes: Figures for the net assets are as of the end of the fiscal year.

PBO calculated the returns for the passive portfolios using the annualised returns of the S&P Global LargeMidCap Index and the FTSE TMX Canadian Governments Nominal Bonds Index.

Like the CPPIB, PBO also calculated the variance of returns for each scenario for the PSPIB.[14] As shown in Table 3-2, the PSPIB’s actual active strategy had the same variance as the baseline passive portfolio.

Unlike the CPPIB, had the PSPIB adopted a passive strategy with increased weight on equities, as shown previously, the average annual return would have been 0.4 per cent higher over the 2006-2018 period, taking into account the lower management costs, but higher volatility. However, the baseline passive strategy would have resulted in a slightly lower average annual return, of 0.3 per cent, over the same period, with the same volatility.

Notes

1. *Parliament of Canada Act*. https://laws-lois.justice.gc.ca/eng/acts/p-1/page-15.html#docCont
2. CPPIB Governance. http://www.cppib.com/en/who-we-are/governance-overview/
3. PSPIB Governance. https://www.investpsp.com/en/psp/governance/
4. *Canada Pension Plan Investment Board Act*. https://laws-lois.justice.gc.ca/eng/acts/c-8.3/FullText.html
5. *Public Sector Pension Investment Board Act*. https://laws-lois.justice.gc.ca/eng/acts/p-31.7/FullText.html
6. While both indicate maximizing long term returns without taking on undue risk of loss, the definition for undue risk of loss could be different between CPPIB and PSPIB.

   As stated in the *Funding Policy for the Public Sector Pension Plans*, one of the funding policy objectives to "limit the degree of volatility in plan funding and achieve stable and predictable current service cost and special payments, recognizing that a certain amount of funding volatility is inherent for the plans."

   https://www.canada.ca/en/treasury-board-secretariat/services/pension-plan/plan-information/funding-policy-public-sector-pension-plans.html#ToC_3
7. Statement of Investment Objectives, Policies, Return Expectations and Risk Management for the Investment Portfolio of the Canada Pension Plan. http://www.cppib.com/documents/1822/Investment_Statement_-_Investment_Portfolio.pdf

   Report on the Public Service Pension Plan for the Fiscal Year Ended March 31, 2018. https://www.canada.ca/en/treasury-board-secretariat/services/pension-plan/pension-publications/reports/pension-plan-report/report-public-service-pension-plan-fiscal-year-ended-march-31-2018.html
8. PSPIB – 2002 Annual Report. Page 1. https://www.investpsp.com/media/filer_public/03-our-performance/01-reports/content-2/PSP-AR-2002-complete.pdf
9. CPPIB only began using these indices in its benchmark portfolio in 2015-16; however, to ensure consistency, PBO used the returns of these indices for the entire period in the analysis.
10. PSPIB – 2018 Annual Report. Page 36. https://www.investpsp.com/media/filer_public/documents/PSP-2018-annual-report-en.pdf
11. CPPIB – 2018 Annual Report. Page 29. http://www.cppib.com/documents/1800/CPPIB_F2018_Annual_Report_English.pdf

12. Both CPPIB and PSPIB currently invest in more asset classes than the two indices used in PBO's passively managed portfolios. This includes, but is not limited to, investments in private equity, private debt, as well as real assets, such as infrastructure and real estate.

    PBO assumed a conservative approach that minimizes the passive strategy return by selecting two broad indices within public equities and fixed income, rather than selecting multiple targeted indices within these asset classes.

    PBO assumes constant ratios and indices used in the passive portfolio over the entire period, which may not truly reflect how the two investment boards would have invested had they used a passive strategy.

13. In order to calculate CPPIB's annual net returns of the active portfolio, PBO assumed an investment return was calculated on half of the annual net contribution amounts. Variance is a statistical measure of the square of the deviation from the mean.

14. In order to calculate PSPIB's annual net returns of the active portfolio, PBO assumed an investment return was calculated on half of the annual net contribution amounts. Variance is a statistical measure of the square of the deviation from the mean.