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The Economics of Low Pension Fees

Netherlands, Canada, Poland, and
the United States

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The Economics of Low Pension Fees: Netherlands, Canada, Poland, and the United States

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Abstract. This paper examines determinants of low pension fees, comparing pension fees in the Netherlands, Canada, Poland, and the United States. The paper uses the framework of supply and demand, recognizing that pension fees are the prices for pension services. The level of pension fees has varied considerably across countries, over time, and within countries. In some cases, pension regulations have succeeded in reducing pension fees, for example, by increasing the transparency of pension fee disclosures (U.S.) or placing a cap on pension fees (Poland). Pension fees also differ across types of pension plans, tending to be higher in individual account plans than in defined contribution plans associated with employers, and tending to be higher in these plans than in defined benefit plans. Economies of scale for plans, individual account balances, and plan service providers all tend to lead to lower fees. The paper focuses on the level of pension fees regardless of whether the fees are paid by employers or participants. The paper finds that while traditionally, focusing on stocks and bonds was appropriate, now, with the growth of investments in alternative investments, particularly in defined benefit plans, that focus misses a major asset class. At least for Canada, the Netherlands, and the U.S., alternative investments tend to have high fees, and including them in the analysis greatly affects some of the results. Our regression results show that the effect of different variables differs to some extent across countries, so that the results of studies focusing on a single country are not necessarily applicable to other countries.

Keywords: pension fees, economies of scale, defined contribution plans, defined benefit plans, investment management fees, pension administration fees
JEL codes: G11, G12, G18, J26, J32

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Introduction

Pension fees can substantially affect the value of assets accumulated in pension accounts at retirement. These fees are the prices of pension services within a context of supply and demand for the pension product. Evaluating pension fees is an important aspect of evaluating pension system performance. The prices for pension-related services in funded pension plans vary considerably across countries, within countries, across plan types and sizes, and over time. Our objective is to provide insight into factors influencing pension fee differences, focusing on determinants of low fees. We include funded defined benefit plans, employer-provided defined contribution plans, and individual account plans.

We analyze pension fees for four OECD countries -- the Netherlands, Canada, Poland, and the United States. These four countries account for five of the ten largest pension funds in the world in terms of pension assets—two in the Netherlands, two in the U.S., and one in Canada² (Pensions & Investments 2022). They also provide a comparison between countries with long-standing pension systems and a country with a relatively young defined contribution (DC) pension system with funded elements (Poland). Each country differs in terms of its reliance on defined benefit versus defined contribution plans. The countries differ in terms of the size of

² The pension plans (with their ranking numbers) are ABP (5) and PFZW (10) for the Netherlands, Federal Retirement Thrift Plan (4) and California Public Employees Plan (6) for the U.S., and Canada Pension Plan (7) for Canada. The ABP, PFZW, and Canada Pension Plan are defined benefit Plans, the California Public Employees Plan is primarily a defined benefit plan, and the Federal Retirement Thrift Plan is a defined contribution plan. The ABP plan is for people working in the government and education sectors. The PFZW plan is for people in the health care and welfare sectors. The Federal Retirement Thrift Plan is for federal government workers and the military. The California Public Employees Plan is for government workers in California. The Canada Pension Plan is a social security plan for all Canadian workers, except those in Quebec Province. While the Canada Pension Plan charges fees of 100 basis points (one percent), the Federal Retirement Thrift Plan, which has passive investments, charges fees of 5 basis points.

the investment market and the size of the pension plans. As a result, they also differ in the investment mix in their pension portfolios. We assess findings from a range of studies on fee structures and test their findings on the four countries selected for comparison.

The paper is organized as follows. The first section reviews past literature on pension fees. The second section uses a traditional supply and demand model to understand how fees act as the prices that pension participants and plan sponsors pay for pension services. The third section discusses types of pension fees, focusing broadly on investment fees and administrative fees. The fourth section presents a comparison of pension fees across the four countries selected. The fifth section uses regression analysis of the determinants of the level of pension fees to explain cross-country similarities and differences. The sixth section summarizes our conclusions about how fees are determined and suggests paths for future research. An annex at the end of the paper describes the basic structures of the retirement income systems in each of the four countries.

1. Literature Review

We begin our literature review with studies of fee comparisons for the four countries we are studying, as well as country-specific studies that suggest results that are consistent across countries and over time. In particular, we discuss findings related to mutual funds, administrative fees, investment fees, economies of scale, and lastly, a number of other important cost factors.

Mutual Funds. Providing a baseline for our study, Khorana et al. (2007) reviewed mutual fund fees in 18 countries in 2002, including the Netherlands, Canada, and the U.S. (but not Poland). That study is not directly related to the fees that pension plans pay but includes financial market fees, which are indicative of the cost of external investment management for defined

benefit plans and the cost of portfolio options for defined contribution plans. In 2002, the asset-weighted average mutual fund expense ratios for equity funds were 111 basis points in the U.S., 161 in the Netherlands, and 256 in Canada. Countries with larger asset bases and larger funds had lower fees.

Providing a more recent comparison, Morningstar (2022) analyzed mutual funds in 26 countries, including the Netherlands, Canada, and the U.S. (but not Poland). The average fees in the Netherlands, Canada, and the U.S. declined over the period 2002-2020. The Netherlands (88 basis points) and the U.S. (63 basis points) had the lowest asset-weighted median fees for equities, while Canada (176 basis points) had the sixth highest. The Netherlands (48 basis points) and the U.S. (43 basis points) also had some of the lowest fees for fixed income funds. According to another study by the European Commission (2018), Poland was one of the countries with the highest median fees across the various fund types, ranging from 91 basis points for money market funds to 403 basis points for equity funds.

Administrative Fees. Tuesta (2014) studied administrative fees for pension plans in 53 countries and found that fees in larger markets were lower, explaining at least in part the U.S. having lower fees. In 2020 in the Netherlands, the average administrative fee per pension participant was €107 (van Alfen 2022). These administrative fees are higher than those in the U.S. for large pension plans. In Poland, administrative fees are generally charged as entry fees, and their level differs between capital-guarantee pension funds (1.1 percent) and life insurance pension plans without guaranteed capital (2.5 percent) (European Commission 2018).

Fee levels may be determined by who pays them. For example, employers may be motivated to seek lower fees when they are paying them directly. In the U.S., when more plans shifted to paying administrative fees out of plan assets so that participants rather than the plan

sponsors paid for them, reported fees increased. U.S Government Accountability Office (U.S. GAO 2022) analysis found that total administrative fees paid directly by plans increased from 5 basis points in 2010 to 8 basis points in 2019, an increase of 60 percent, for plans reporting administrative expenses.³

Investment Fees. Tapia and Yermo (2008) analyzed investment and administrative fees charged to participants in mandatory defined contribution pension systems in Latin America, Central and Eastern Europe, Australia, and Sweden. They found that fees are influenced by (i) the size and maturity of the system, (ii) market structure, (iii) competition, (iv) investment strategy, and (v) regulations. In terms of system maturity, relatively new systems had higher fees. Investment in interest-bearing assets, such as deposits and bonds, cost less than investment in equities, and passive investment strategies cost less than active investment. Their findings set the stage for similar issues raised in other research papers.

Han and Stańko (2020), using data from pension supervisory authorities, reviewed 85 pension plans in 44 countries. Occupational defined contribution and personal plans linked to employment tended to be more cost effective than personal account defined contribution plans without a direct employer link. Their key finding was a decrease in fees and caps over time, where caps are government regulations for maximum fees.

While studies of investment fees typically have focused on the fees paid for stocks and bonds, investments in alternative assets have grown in importance in defined benefit plans in some countries. Aubry (2022) found that these investments increased from 9 to 34 percent of the investments of U.S. state and local government pension portfolios over the years 2001-2022. A

³ All types of administrative fees, including professional fees, contract administrator fees, investment advisory and management fees, and other fees increased in absolute terms and as a share of plan assets during that period

study by Mączyńska et al. (2022) mentions that fees in pension funds in the Netherlands in 2007-2021 depended mostly on the asset classes chosen. Moreover, they found that reported costs have been increasing as a result of an implemented cost-transparency policy.

Economies of Scale. Mitchell and Andrews (1981) examined the efficiency of U.S. pension plan operations in the private sector, focusing on the relationship between plan size and administrative expenses of pension funds. The authors estimate cost equations for multiemployer and defined benefit plans for individual industries and across the private sector. Economies of scale in plan administration were found to be an important determinant of the level of fees.

Brikker and de Dreu (2009) analyzed administrative and investment fees for Dutch pension plans between 1992-2004. They found that economies of scale were the most important determinant of the level of fees across pension funds. Industry-wide pension funds, due to their larger size, were more efficient than company funds. Higher shares of pensioners relative to participants raise costs, but the reverse is true when relatively many participants are inactive (not currently working for the employer sponsoring the pension plan).

Bauer, Cremers, and Frehen (2010), using U.S. data, found that the average annual cost levels for the smallest and largest 30 percent of domestic equity investments of defined benefit funds were 40 and 15 basis points, respectively. Externally managed funds were found to be more expensive for pension funds than their internally managed funds. Further, pension plan participants benefit from the larger size of their pension plans through lower cost levels in internally managed domestic equity portfolios. The finding that larger funds have lower costs in externally managed mandates indicates pension funds' bargaining power with external parties, presumably an effect of economies of scale.

In 2022, the U.S. Government Accountability Office (GAO 2022) analyzed investment fees for U.S. 403(b) plans.⁴ Fees ranged from 1 basis point to 237 basis points. University, government, and other plan sponsors with \$1 billion or more in assets reported taking steps to reduce fees. Smaller plan sponsors reported not having sufficient information to monitor fees well, providing an explanation for economies of scale. Large 403(b) plans generally had lower administrative costs per participant than smaller ones.

Fornia and Rhee (2014) found that U.S. defined contribution plans had higher fees than defined benefit plans because of economies of scale, with defined contribution plans facing diseconomies because of individually managed accounts. Hoekstra's (2022) analysis suggests similar concerns as a number of pension plans in the Netherlands have been merging to control their costs through economies of scale in the face of regulation relating to the transition to defined contribution plans in the Netherlands.

Beath et. al., (2022) explores how large institutional investors use scale to achieve real outperformance, through lower costs, greater diversification, and better risk management. It highlights the importance of active management, pooling resources, and reducing investment fees for long-term success.

Other Factors Affecting the Level of Pension Fees. Turner and Witte (2008) discussed issues related to fee disclosure requirements. Clarity and transparency of fee disclosures can reduce the level of fees. Hastings and Mitchell (2020) showed that Chilean investors with greater financial knowledge paid lower fees when investing in mutual funds.

⁴ These plans are similar to 401(k) plans established by businesses and are offered by government entities and in the nonprofit sector

Ayres and Curtis (2015) analyzed fees in U.S. 401(k) plans using data for 2010. They found that many 401(k) plans had investment menus that forced participants to hold high-fee portfolios. Fee and investment menu restrictions in an average plan cost 78 basis points in excess of index funds. They also documented an array of “dominated” menu options, which they defined as funds that make no substantial contribution to menu diversity but charge fees substantially higher than those of comparable funds in the marketplace. In addition, they found substantial variation in plan costs for plans of similar size.

A tendency towards high-fee funds in U.S. pension plans, however, may have been changing over time. Kozlowski (2022) studied changes in investment options offered by large U.S. pension plans in 2021 and found that many plans had lowered their costs over time by moving to lower-fee investment options and reducing the number of external investment managers. Changes also included switching to lower-cost passive portfolio management. Furthermore, a single manager for target-date funds and passive investment strategies could often result in scale economies for investment.

In 2020, in the Netherlands, asset management fees, including transaction costs, rose by €1.3bn to €9.3bn, an increase of 16.9 percent from the year before. Most of the increase (€787m) was for performance fee payments, mainly to private equity managers, with another €438m stemming from an increase in transaction costs. Private equity is a high-fee asset class that is considered an alternative investment, primarily invested in by defined benefit plans rather than defined contribution plans, in part because it tends to be illiquid. As a percentage of assets under management, investment management costs rose from 55 basis points to 57 basis points, as assets under management also rose by 12.9 percent to €1631bn (van Alfen 2022). By comparison, the U.S. is one of only a few countries in the Morningstar (2022) survey to require

that performance fees paid to fund advisers include a symmetrical reduction in fees for underperformance, also known as fulcrum fees.

In 2021, as the result of large stock market gains, more U.S. pension plans were large enough to qualify for investments in collective investment trusts (CITs) and were charged lower fees. Collective investment trusts are a cost-effective alternative to mutual funds for defined contribution plans. They are tax-exempt, pooled investment vehicles available only to defined contribution plans. The pooled accounts are held by a bank or trust company. The financial institution groups assets from pension plans to develop a single larger, diversified portfolio.

Pieńkowska-Kamieniecka et al. (2021) analyzed individual pension plans in Poland and found that the more readable a pension contract is, the higher are the costs charged. They observed that cost ratio increases with the risk profile of the pension fund that fits in with findings of the research by Mączyńska et al. (2020) and Rutecka-Góra et al. (2020). They also observed that regardless of the risk level, costs are similar for pension products offered by providers belonging to the same financial group. In another study, Rutecka-Góra et al. (2022) analyzed the fee complexity of many individual pension contracts in Poland, making it difficult for participants to compare pension providers based on their fees.

Summary. Cross-country comparisons indicate that fees vary greatly across countries, including those in our study. Economies of scale appear to be a large part of such variation. Countries with larger pension asset bases investing in larger funds more often had lower fees. Fees also varied according to the types of plan investments included, with fee structures more costly for public equity funds (stock market) than fixed-income funds. Finally, individual pension plans not tied to an employer were more costly than employment-based plans. Country-specific issues may also be important.

2. The Economics of Pension Fees: Supply and Demand

Fees are the prices that pension participants and plan sponsors pay for pension services. As such, fees can be analyzed using traditional supply and demand analysis.

Supply. Inputs to the pension production function include the time and expertise of industry professionals, including employer-sponsored pension fund management and investment companies, as well as employees and individuals investing for their own accounts. Actions of plan sponsors and investment providers affect the marginal cost of pension services provided. The size of a pension plan and the size of the accounts of participants within a defined contribution plan will affect the marginal cost of pension production (asset growth for retirement). Economies of scale in investments also affect the fee supply price. Competition can lead to supply-side shifts by reducing the cost of services to both larger pension plans and larger investment accounts. The length of time that investment funds have been in operation may also affect fees structures and levels as plans become more efficient over time, lowering their marginal costs. Growth of plan assets allow firms to qualify for or negotiate lower fees and reduce the marginal cost to service providers. Government regulations setting maximum fees, and thus affecting supply curves, may also reduce costs. In the U.S., fee competition for passive investment between two giant mutual fund companies, Vanguard and Fidelity, may have also led to lower fee structures across-the-board.

Demand. Actions of pension participants and plan sponsors influence the fee structure of pension plans on the demand side. For example, changes in demand toward bonds or passively managed funds by plans or participants will tend to reduce fees in defined contribution plans. Increased awareness of pension fees on the part of pension participants, possibly through improvements in fee disclosure, may also reduce costs by leading participants to choose

investments with lower fees. Participant lawsuits could reduce fees as providers take steps to avoid lawsuits by offering investments and services with lower fees.

3. Types of Pension Fees

To better understand past research and recent findings, the complexity of fee structures needs to be considered. The U.S. Department of Labor (2022), which regulates pension plans, indicates that pension fees are generally calculated one of four ways:

- Asset-based: expenses are based on the amount of assets in the plan and generally are expressed as percentages or basis points.
- Per-person: expenses are based upon the number of eligible employees or actual participants in the plan.
- Transaction-based: expenses are based on the execution of a particular plan service or transaction.
- Flat rate: fixed charge that does not vary, regardless of plan size.

Supply and demand affect fee structures at every stage of the process. We focus on the fees paid during the accumulation stage of pension investment, excluding other business expenses such as active workforce management or retiree distributions. We look at two types of pension fees—investment fees and administrative fees.

Investment Fees. Investment fees cover the costs of managing investments held by pension plans and include research for actively managed portfolios, portfolio trading fees, custodial fees, and marketing fees.

Data for specific fees are not always reported separately. Marketing fees are generally not itemized and are included in investment expenses. Pension participants may also incur fees for financial advice from plan sponsors or service providers that are usually not identified separately unless they constitute a sizable share of costs. Trading fees are generally not included in statistics on pension fees because they are not disclosed but are netted out of asset prices. Trading fees

associated with buying and selling securities are tied to portfolio turnover and are consequently higher for actively managed funds than passively managed funds.

Bogle (2014) notes that while U.S. brokers' commission rates have declined substantially in the U.S., aggregate portfolio turnover had increased from 30 percent in the early 1960s to 140 percent in 2014. He also notes that investment costs, including the cost of trades, are difficult, if not impossible, to quantify with precision. He estimates that, on average, actively managed investments incur trading fees of 50 basis points, while passively managed investments incur trading fees of near zero basis points. Later data on turnover indicate that at the end of 2020, the asset-weighted average turnover rate for equity mutual funds was 32 percent, and the asset-weighted average for equity mutual funds in 401(k) plans was 26 percent (ICI 2021).

Actively managed investments have higher fees than passively managed investments, which generally results in lower net rates of return for actively managed investments in efficient investment markets, such as major stock markets (Elton, Gruber, and Souza 2019). Halim and van Bragt (2018), using CEM Benchmarking data for 2016, found that the average expense ratio for U.S. passively managed large-cap stocks held by defined contribution plans was 3 basis points, compared to 42 basis points for actively managed large-cap equity mutual funds. The difference was even larger for small-cap equity mutual funds—5 basis points for passively managed, compared to 65 basis points for actively managed.

A cause of the decline in 401(k) plan fees in the U.S. has been the pension fee lawsuits concerning both administrative and investment fees, which have not been a factor in the defined benefit or Individual Retirement Account (IRA) market. Over the past fifteen years, pension litigation related to investments and fees has focused on defined contribution plans (Turner 2021). Another factor presumably was the U.S. Department of Labor (2012) rule to improve

transparency in fee disclosures to 401(k) plan participants, which has not affected IRAs.

Kronlund et al. (2020) found improved flows into low-fee funds in 401(k) plans following implementation of the regulation. However, the U.S. Government Accountability Office (2021), a part of the federal government, found a weak effect of the improved disclosures on participant knowledge concerning fees, so the lawsuits may have been a more important factor.

Administrative Fees. Administrative fees include many different fees and expenses. The U.S. Department of Labor (2022) lists 23 types of plan administrative expenses for ongoing pension plans and other types of expenses and fees for starting and terminating plans. Administrative fees include for record keeping, participant loan processing, account maintenance, contract administrator charges, participant communication, including the cost of printing and mailing information to participants, claims processing, and shareholder services. Such fees also can include actuarial costs, legal expenses, and expenses related to filing government reports, depending on the country and type of plan.

The U.S. Thrift Savings Plan for federal government workers, members of Congress, and the military is an example of a defined contribution plan with very low fees. The total investment and administrative fees for 2021 charged to participants ranged from 4.3 to 5.9 basis points. The administrative fees were 4.3 basis points. The investment fees ranged from 0 basis points for a government bond fund to 1.6 basis points for a small-cap equity fund⁵ (Thrift Savings Plan 2022). Briker and Dreu (2009) analyzed administrative and investment fees for Dutch pension plans between 1992-2004. Defined contribution plans had lower administrative costs than defined benefit plans.

⁵ Small cap refers to companies that have a market value (capitalization) of less than a certain amount.

U.S. defined benefit plans pay mandatory Pension Benefit Guaranty Corporation insurance, as well as actuarial costs relating to determining funding. These fees and services are not required by defined contribution plans. Similarly, the Province of Ontario, Canada has the Pension Benefits Guarantee Fund (Financial Services Commission of Ontario 2022).

In Poland, administrative fees generally include an up-front fee (on contributions), both per person and in percentage terms, a handling fee (only in insurance pension products), and a cancellation fee (Rutecka-Góra et al. 2020, Pieńkowska-Kamieniecka et al. 2021). In this younger pension system, market up-front fees may be substantially cut by introducing caps on fees, as was done in Polish open pension funds in 2010 and 2014.

Some employers completely or partially bear administrative costs by including plan administration cost in the cost of their employee benefits packages. In other cases, these costs are paid out of fees for the plan's investment products. Known as revenue sharing, this effectively shifts costs in defined contribution plans to pension plan participants rather than plan sponsors (Ayres and Curtis 2015).

Financial Advice Fees. The selection of pension investments is an integral part of providing a pension, and fees for investment advice in that process need to be included. They are for defined benefit plans and for the selection of investment menus in defined contribution plans. They are not included, however, in individual account plans that are not associated with an employer, such as Individual Retirement Accounts (IRAs) in the U.S.

When individuals have pension accounts where they are responsible for making investment decisions, and they do not have a limited menu of choices selected by a fiduciary, they probably are more likely to seek financial advice. The costs of financial advice to pension participants can be considerable. Financial advisors generally charge around 1 percent of assets

(100 basis points) annually in the U.S., while in Canada, they generally charge around 2 percent (200 basis points) (Hernandez 2022). By contrast, in Poland, pension plan providers do not charge additional fees for financial advice in collective or individual pension plans.

4. Cross-Country Comparisons

Morningstar (2022, p. 6), in its international comparison of pension fees, notes, “Given the differences in the way fees are calculated, reported, and named across different markets, it can be difficult to ensure like-for-like comparisons.” Each of our four countries has a different pension plan structure, and regulatory system (See Annex 1) and each has had substantial change in their investment portfolios over time. Nonetheless, while it is difficult to develop comparable data for each of the four countries included in our study, information about key economic variables can provide insights to assess why different pension systems might have higher or lower costs.

Fees in the large U.S. market are clearly related to economies of scale, competition among mutual fund providers, and a preference for passively managed funds. Regulation has played a critical role in driving down fees in the Netherlands and Poland. For example, when the Dutch Retail Distribution Review was implemented in 2014, investors were shifted from share classes where financial product providers paid fees to advisors to select those classes into classes without those fees. This regulation caused a drop in fees for participants (Morningstar 2022).

In Poland management fees charged by mutual funds decreased in the years 2018-2021 as a direct result of a cap on those fees introduced by law. It caused management fees dropping from 3.2 percent to 2.2 percent for equity funds and from 3.1 percent to 2.1 percent for mixed funds. The cap on asset management fees in open pension funds in Poland resulted in decrease of management fees from 0.6 percent to 0.48 percent in years 2003-2021.

Indirectly, U.S. 401(k) funds changed their investment strategies in reaction to the financial industry's regulatory structure. At year-end 2006, about 25 percent of U.S. 401(k) plans' assets were in mutual funds with load fees. A load fee is a fee charged when a person buys or sells mutual fund shares. However, these fees often were waived for participants in retirement plans (Investment Company Institute 2007). At year-end 2021, 95 percent of mutual fund assets in 401(k) plans were held in institutional and retail no-load share classes, while the remaining assets were held in load share classes, mostly in share classes that do not charge retirement plan participants a front-end load.⁶ Over the past decade, institutional no-load shares have grown as a segment of 401(k) mutual fund assets (Investment Company Institute 2022a). Thus, over time the use of load fees has declined so that in 2021, few, if any, pension participants were in plans with load fees. While U.S. 401(k) plan participants incurred an average expense ratio of 77 basis points for investing in equity mutual funds in 2000, by 2021, that figure had fallen to 36 basis points, a substantial 53 percent decline (Investment Company Institute 2022a).

Insert [Table 1](#) here.

Asset Allocation: Panel A of [Table 1](#) shows large differences in the investments of pensions in the four countries we focus on, accounting for some of the differences in total investment fees. For example, in Poland, 84.9 percent of pension assets were invested in equities in 2020, while in the Netherlands, only 30.8 percent were. Investments in equities, and actively managed investments in equities, have higher fees than investments in bonds, including fees for portfolio turnover. By contrast, the Netherlands held 47.5 percent of its assets in bills and bonds, and Canada to 30.4 percent. Bills and bonds tend to have lower investment fees than other investments unless they are privately traded.

⁶ A no-load fund is a mutual fund in which shares are sold without a commission or sales charge.

The allocation to traditional asset classes of equity/fixed income has declined for all the countries. The value-weighted panel of Table 1 shows that large pension funds experienced a more dramatic change of asset allocation over the last two decades than did smaller funds. Dutch pension funds kept a significant amount of fixed income even during the low-rate period. Canadian and U.S pension funds substantially allocate to private equity and real estate. Canada has an increasing trend in infrastructure investment.

Investments in equity/fixed income as a percentage of portfolios have declined for all the countries. The value-weighted panel shows that large pension funds experienced a more dramatic change of asset allocation over the last two decades than smaller funds. Comparing plan-weighted data with value-weighted data permits us to examine the effect of plan size because small plans dominate plan-weighted data, while large plans dominate value-weighted data.

Other investments include alternative investments, such as private equity, hedge funds, real estate, and commodities. These asset classes tend to have very high fees. In 2020, Canada had 38.3 percent of its pension assets in this category, compared to 19.0 percent in the Netherlands, 2.1 percent in Poland, and 11.1 percent in the U.S. ([Table 1](#)). Over the period 2010 to 2020, there was a substantial increase in investments in this category in Canada, a small increase in Poland, and stability in the percentage of the portfolio in this category in the Netherlands and the U.S.

According to Cerulli Associates, less than 1 percent of U.S. defined contribution plans offer private credit, private equity, or hedge funds as investment options. Most alternative assets in defined contribution plans are private real estate, offered by 10 percent of the plans (of those that work with institutional consultants). “Only 4% of target-date managers allocate to [private

equity] and private debt, and none allocates to hedge funds within their off-the-shelf target-date series,” according to the September 2022 edition of the Cerulli Edge report (Cerulli 2022).

In the U.S., 31.3 percent of pension assets are invested in collective investment trusts where look-through to the underlying investments is unavailable, which makes it difficult to compare the U.S. to the other countries because the percentage held in equities and bills and bonds in those plans is unknown in these data. A collective investment is a group of pooled accounts, held by a bank or trust company. The financial institution groups assets from individuals and organizations to develop a single larger, diversified portfolio. The primary objective of a collective investment fund is to lower costs through economies of scale.

Economies of Scale: Panel B of [Table 1](#) shows pension assets as a percent of GDP in the four countries in 2010 and 2020. Because of economies of scale, countries that have larger pension systems relative to GDP tend to have lower fees. By this measure, the Netherlands has by far the highest pension assets as a percent of GDP at 212.7 percent, with the U.S. coming in second at 96.8 percent. The Netherlands also has large industry-wide plans that benefit from economies of scale in investment management.

Pension assets as a percent of GDP increased the most in the Netherlands--by 78.9 percent. They increased as well in Canada and the U.S. However, in Poland, pension assets decreased by 57.8 percent, primarily due to the transfer of debt from open pension funds (OFEs) to the Social Insurance Institution (ZUS), as part of a reform that defunded public pensions (see Szczepański et al. 2022).

Economies of scale in pension plans depend on a number of factors, including the total size of pension assets overall, the size of individual pension funds, and the distribution of plans by size. Consequently, additional data would be needed to compare scale economies across our

four countries. But even without that analysis, one might hypothesize that the U.S. system, with far greater pension assets than the three other countries, could enjoy greater economies of scale.

Type of Plan: Panel C of [Table 1](#) shows the split of pension assets by type of plan. Personal defined contribution plans tend to have higher fees than occupational defined contribution plans, which particularly affects Poland, where 81.2 percent of pension assets are in personal defined contribution plans. Both types of defined contribution plans have higher fees than defined benefit plans (Munnell, Aubry, and Crawford 2015). The evidence suggests that defined contribution plans generally have lower administrative fees than defined benefit plans but that investment fees are higher, and that generally, overall, fees are higher in defined contribution plans than defined benefit plans.

Portfolio holdings and economies of scale help explain some of the differences in fees in cross-country comparisons. Because investments in alternative investments have higher fees than equities, which generally have higher fees than investments in bonds, asset allocation data suggest that Canada would have the highest fees, all other factors equal, while Poland, the U.S., and the Netherlands pensions would have lower fees. However, economies of scale are likely to lead to higher fees in the much smaller Polish pension system and lower fees in the U.S.

5. Empirical Analysis of Pension Investment Fees

Using CEM Benchmarking data, we compare investment fees for Canada, the Netherlands, and the U.S. Our CEM data set does not have data on Poland, but we supplement this data with data we collected on Poland. It's worth noting that the pension-fund names are not disclosed in the CEM dataset used for this empirical analysis. This is done to maintain the confidentiality of the data provided by the pension funds. We provide key descriptive statistics

and conduct regression analysis assessing the impact of variables that may lead to higher or lower fee structures.

CEM Benchmarking Inc. is a global company analyzing performance metrics, asset allocation strategies, and cost structures for more than 1,000 pension, endowment, and sovereign wealth funds across 18 countries. The data in our study includes 256 Canadian, 73 Dutch, and 600 U.S. large pension funds over a twenty-six-year period, 1992 – 2017. The dataset provides information on investment management fees only. Data on investment transaction fees and administrative fees are not included. The dataset does not include information on individual account plans that are not related to employment.

While CEM data are a valuable source of information on fees, they are not nationally representative, as they include a self-selected set of large plans seeking benchmarking information. This distinction may affect the comparability of the descriptive statistics below, but presumably not our regression analysis. Only a handful of large DC plans are included in our version of the CEM database received in 2019, included on account of their similar asset allocation and operating model as other large global DB plans. That said, CEM does collect option level data from 100 or so North American DC plans in an alternate database that are not included in this study due to cross-data comparability. The lack of defined contribution plans in our sample would affect cross-country comparability for the United States the most, as private-sector pensions have shifted strongly towards defined contribution plans over time. The effect on comparability is less for U.S. public sector plans, which still are predominantly defined benefit plans. This distinction does not affect the Netherlands as there are few defined contribution plans. It also has little effect on the comparability of the results for Canada because the Canadian pension system is predominantly a defined benefit system, as well.

Insert [Table 2](#) and [Table 3](#) here.

Insert [Figure 1](#) and [Figure 2](#) here.

Descriptive Statistics. [Table 2](#) (also see [Figure 1](#) and [Figure 2](#)) shows that the percentage of assets invested in public equity (the stock market) has declined in the three countries over the twenty-six-year period 1992-2017, with the percentage invested in alternative investments increasing. Comparing public equity (stock market) fees, the U.S. has the lowest fees, followed by the Netherlands and Canada ([Table 3](#)). However, when alternative investments such as private equity and hedge funds are included in the comparison, the country order changes. In 2017, the final year of our data, the Netherlands has the lowest fees for our sample of large pension plans, followed by Canada and the U.S., which has the highest fees ([Figure 3](#)).

[Figure 1](#) disentangles listed and unlisted real estate. Publicly traded (or listed) real estate investments, such as REITs, only capture a small part of the real estate investment universe. Listed real estate is highly liquid, with readily observable market prices. But indices of listed real estate prices indicate substantially higher volatility and substantially low diversification benefits than do indices of private real estate (Garay 2016). Beath and Flynn (2018) also found REITs had the lowest returns and the highest liquidity, but lowest volatility.

Insert [Figure 3](#) here.

Over one-third of the Canadian and U.S. pensions in our CEM sample are public pensions. We use the term “public pensions” to refer to pensions provided by government entities for government workers, elected officials, members of the judiciary, and the military. All Dutch government workers are in a single pension plan, (only one of the Dutch pensions in our sample is a pension for government workers). Because of the expansion of alternative investments, fees of public pension plans for government workers have grown more rapidly than

those for private plans and now are higher than the fees for large private pension plans in Canada and the U.S. ([Figure 4](#)).

Insert [Figure 4](#) here

The CEM database we use for our analysis does not distinguish between defined benefit and defined contribution plans. However, Bauer, Cremers, and Frehen (2010), used CEM data for the United States and found that the median annual investment fees for defined benefit plans were 27 basis points, compared to 51 basis points for defined contribution plans. Halim and van Bragt (2018), used CEM data for the U.S. for the years 2007-2016, and found that defined benefit plans had fees on average of 60 basis points, compared to fees for defined contribution plans of 39 basis points. We believe the explanation for the difference between the two studies is that large U.S. defined benefit plans have increasingly invested in alternative investments, which generally have high fees.

Over the period 1992 – 2017, total fees in basis points paid by the pension funds in our sample increased in the Netherlands, Canada, and the U.S. ([Figure 3](#)). Based on previous studies, we had expected to find decreasing fees over the period. Real estate investment fees for large pension plans were highest in the U.S. across the sample period.

Regression Analysis. We relate investment fees to the asset size of the funds, the percentage of retired members, the role of investment style, and asset allocation decisions to determine how these factors affect pension fees and whether we find specific differences between countries. [Table A1](#) provides data on pension plans included in the regression analysis and in the descriptive statistics for each country. We study cross-sectional differences in institutional investor investment costs using pooled panel regressions with year and fund fixed effects:

$$C_{i,t} = \beta_0 + \beta_1 Size_{i,t} + \beta_2 \% Retired_{i,t} + \beta_2 \% Ext_{i,t} + \beta_3 \% Act_{i,t} + \beta_4 \% FOF + \beta_5 \% Asset_{i,t} \\ + \beta_6 Y_t + \beta_7 f_i + u_{i,t}$$

where $C_{i,t}$ refers to the investment costs of fund i in year t , f_i captures fund-fixed effects, Y_t represents year-fixed effects and $u_{i,t}$ are idiosyncratic errors. $LogSize_{i,t}$ is the log of the pension fund assets in domestic currency. $\%Retired_{i,t}$ is the percentage of retired members from total pension fund members. $\%Act_{i,t}$ refers to the percentage of actively managed asset and $\%Ext_{i,t}$ captures the percentage of externally managed pension assets. We also include $\%FoF_{i,t}$, the allocation of pension assets to Fund-of-Funds⁷.

Insert [Table 4](#) here

[Table 4](#) shows our regression analysis separately for each country – Canada, the Netherlands, Poland, and the U.S. Three modeling specifications are reported for each. except for Poland, due to imbalanced sample data.⁸ Even though every country has a unique pension system, the marginal effect of the log of the size of assets on the level of fees is remarkably similar in magnitude for all countries (although the coefficient is not statistically significant for the third Netherlands equation). The second column of [Table 4](#) indicates that doubling fund size reduces fees by about 5 basis points ($= \ln 2 \times 7.08$). This supports evidence found in many other studies that economies of scale may be one of the most important factors in reducing the cost of pension fund investments. The coefficient of the interaction term $LogSize \times Public$ depicts the extra

⁷ Over time, asset owners increased their allocation to private markets by committing capital to Fund-of-Funds (FoFs). FoFs are primarily capital aggregators: pooling capital from different asset owners gives them enough cash to meet the minimum investment amount in private market funds. \$15m could be a minimum investment ticket for a \$10 b fund. FoFs charge a management fee and often carry interest, creating a second layer of fees and reporting returns to their limited partners (LPs) on a net-net basis.

⁸ The Polish data comes from author's collection. We collected ten Poland pension funds cost and fund size data over the period 2005 to 2011. The more recent data source on cost is not publicly available.

amount of investment cost taken by public funds. As evidenced in column 2, doubling the fund size is associated with a 1.5 basis point decrease in investment cost.

It indicates the economies of scale effect is weaker among large Canadian public pension funds.

Three other variables show consistency in each of the three countries studied. The percent of assets invested in fixed income securities has a large, significantly negative impact lowering the cost of pension investments. By contrast, actively managed portfolios and private equity investments exhibit strong, significantly positive impacts on fees, increasing costs in all three countries.

Nonetheless, there are a number of investments categories that have dissimilar fee impacts. For example, while our analysis identifies economies of scale for all three countries, when the log of assets is interacted with public (government-employee) pension plans, the effect is significantly positive for Canada, indicating a weaker scale effect for public-sector plans. The impact of public pension status in the U.S. regression is the opposite to that of Canada; it is significantly negative. Public pension plans in the U.S. are known to be some of the largest in the nation. Furthermore, pension plans in Canada tend to invest in two asset classes with higher fees—private equity and alternative investments.⁹ (Because there is only one public pension plan included in the Netherlands data, we do not enter that variable for the Netherlands.)

While the percent of equity has a significant negative impact for pension funds for Canada and the U.S., the coefficient is not significant for Dutch pension funds. This may have to do with the relative level of fees for different investment classes in each country, although we do not have a more precise explanation.

⁹ Alternative investments can include real estate, private mortgages, private company stock, oil and gas limited partnerships, precious metals, and intellectual property (Easton 2022).

Similarly, the percent of assets invested in real estate has a significantly negative impact for Canada and the U.S., but it is not significant for the Netherlands. This is a particularly difficult investment category to measure, however, as publicly traded real estate that is invested in highly liquid investments such as REITs (Real Estate Investment Trusts) only capture a small part of the real estate market. Our results suggest that the reason that Canadian pension funds have lower fees might be a result of in-house investment management (Beath et al. 2021).

Another striking cross-country difference is found in infrastructure investments. The U.S. is the only country in which these investments have a positive and significant impact on pension fees, raising the fees. There has been a surge in the allocation of institutional investor assets to infrastructure investments over time, with attractive attributes such as low sensitivity to swings in the business cycle, little correlation with equity markets, and long-lasting inflation-lined cash flows. Nonetheless, these are still a small proportion of fund investments in each country (see Table 3).

While our data set does not have a variable directly indicating if a plan is a defined benefit or defined contribution plan, there is a question about the discount rate used by the plan for valuing liabilities. We interpreted a response of ‘zero’ as indicating that the plan is a defined contribution plan. While we are aware that this is a highly imperfect measure, this dummy variable is significantly positive for Canada but insignificant for the United States. We did not test for an effect in the Netherlands because few plans are defined contribution. In terms of the impact of retired participants, each country goes its own way. The percentage of participants who are retired has a negative effect on fees in the Netherlands, a positive impact in Canada, and no effect in the U.S., possibly due to the growth in defined contribution plans

The third regression for each country on Table 4 includes a variable for fund of funds. In Canada and the U.S., the coefficient is strongly and significantly positive, raising pension fees. By contrast, it is significantly negative in the Netherlands. A fund of funds strategy has higher expense ratios than regular mutual funds but is intended to achieve broad diversification at minimal risk. In the Netherlands, in-house management may reduce costs.

Investors can invest in infrastructure assets directly or through different types of funds run by general partners GPs. Large Canadian pension plans, Dutch pension funds, and some sovereign wealth funds typically invest directly in infrastructure. Andonov et al. 2021 showed public investors have been increasing their allocation to closed infrastructure funds over time despite their underperformance, which is substantial relative to comparable risk-return investment opportunities in the private markets. However, the fees for investing in closed infrastructure funds seem substantial, and GPs are one of the main beneficiaries from the growth of infrastructure as an asset class.

Insert [Table 5](#) here.

We have supplemented the CEM data for the Netherlands, Canada, and the U.S., whose results are presented in Tables 4 and 5, with additional data we collected for Poland. The data for Poland only has information on plan size and the level of investment fees, and thus has much less detail than the CEM data that has information on different the fees paid for different types of assets. In addition, the Polish data only include ten plans for the years 2005-2011. Nonetheless, this thinner dataset still shows strong evidence of economies of scale.

[Table 5](#) pools the three countries in a single regression to examine country effects on the level of fees. The last column of [Table 5](#) also merges Poland data into the pooled regression. The U.S. is seen to have the highest level of fees, after holding other variables in the regression

constant. Compared to the U.S., Canada and the Netherlands have significantly lower fees.

Factors that had a significant positive effect, raising fees, were active investment management, exterior investment managers (outside of the plans), investing in a fund of funds, and investing in private equity. Factors that had a significant negative effect, lowering fees, were plan size, plan size interacted with public pension funds, investments in equity, fixed income investments, real estate investments, and being a public pension plan. We show in these regressions that investing in public equity (the stock market) has a negative effect, presumably because those fees are so much lower than fees for private equity investments.

6. Conclusions

Our research examines the determinants of pension fees, building upon the findings of earlier research. We consider pension fees within a traditional framework of supply and demand, as fees are the prices for pension services. We investigate the determinants of pension fees in Canada, the Netherlands, Poland, and the United States. Two of our countries are heavily weighted towards defined benefit plans (Canada and the Netherlands), the third is a young system based on defined contributions plans (Poland), and the fourth has become a hybrid mix of defined benefit and defined contribution plans (U.S.).

Our key empirical findings are twofold. First, economies of scale are identified in each of the four countries we study, strongly supporting the findings of earlier research. Second, contrary to earlier research, we find total pension fees, measured in basis points, have increased over time for large pension plans. Earlier studies, focusing mainly on traditional investments, show a pattern of decreasing fees. However, including non-traditional, alternative pension investments, with higher fees than stocks and bonds, has raised total fees over time. We also find that previous studies focusing on a single country are not necessarily generalizable to other countries, as our regression results find significant differences across countries.

Earlier Findings

In this part of the conclusions, we briefly summarize our literature review. Past research has identified a locus of fee-reducing factors for many pension systems around the world. While our analysis cannot confirm each of these findings, we have used past studies to direct our research.

Supply-Side Factors: Many studies of pension costs indicate that economies of scale are crucial in reducing pension costs. Fees are lower for larger pension plans, for larger investment management companies, and for larger investment funds. Pension investment fees tend to be lower in defined benefit plans than in defined contribution plans and higher in individual pensions not tied to employers. Policies that permit or encourage small pension plans to join groups of plans can also reduce pension fees through economies of scale.

Demand-side Factors: Participants with greater financial literacy tend to choose lower-fee investments in defined contribution plans. With greater transparency in fee disclosures, participants also tend to choose lower-fee options.

The role of public policy and regulation cannot be ignored. Policies that require greater transparency in pension fee disclosures assist participants in selecting low-fee options. Fees can also be reduced when governments place a cap on fees. Enforcement of fiduciary responsibility by plan sponsors to provide investment options in low-fee defined contribution plans can reduce fees.

Empirical Findings

In this part of the conclusions, we briefly summarize our empirical findings. Our findings support those of other studies indicating that economies of scale are a key in reducing pension

fees. We also find that portfolio choice and investment management style (passive versus active) are key determinants.

Using the CEM database, the impact of other variables was similar for each of the countries studied. The percent of assets invested in fixed income securities has a large, negative impact reducing the cost of pension investments. By contrast, the share of actively managed portfolios and private equity investments were positive for all three countries, raising relative pension costs.

Our regression analysis also indicates that other determinants of pension fees differ considerably across countries. For example, in our pooled regressions, public pension plans have lower fees than private plans, but in country-specific regressions, public pension plans provided by governments for their employees have higher fees than private plans in Canada but lower in the U.S. In the pooled regressions, external management has a positive effect on fees, while in the country-specific regressions the effect is not significant for the Netherlands.

Between 1992 and 2017, total fees reported by funds included in our CEM database, measured in basis points, increased in the Netherlands, Canada, and the U.S. The U.S. had the highest fees, followed by Canada and the Netherlands (Table 3). We expected to find fees decreasing over time, based on earlier studies. However, that research often did not include fees for alternative investments, focusing on public equity (stock exchange listed) and fixed income securities. Alternative investments in private equity, infrastructure, hedge funds, and real estate have increased over time as a share of pension assets as pension plans have adjusted to changing financial market conditions.

While we studied which factors have influenced the fee structure of pension plans, we have not addressed circumstances under which lower fees are desirable. Numerous studies have

indicated that higher fees from the active management of assets in transparent, competitive markets, such as large equity markets, are generally not rewarded by proportionally higher gross rates of return, and as a result, net returns are reduced (Elton, Gruber, and de Souza 2019).

We have not studied whether the higher fees for alternative investments, such as private equities, foreign markets, real estate, and small cap equities, result in lower rates of return or are used to support other objectives. Portfolio managers may select higher-fee alternative investments for risk reduction, diversification, and reduced portfolio volatility. Research is still needed to fully understand the complicated role of pension fees in plan management in today's changing capital markets.

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93

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Table 1. Pension system overview (OECD Global Pension Statistics, 2010 and 2020.)

	Canada		Netherlands		Poland		United States	
	2010	2020	2010	2020	2010	2020	2010	2020
Panel A. Allocation of assets in pension plans in selected asset classes and investment vehicles as a percentage of total investment								
Equities	33.8%	26.8%	35.6%	30.8%	36.3%	84.9%	29%	33.7%
Bills and Bonds	35.5%	30.4%	42.1%	47.5%	59.4%	8.8%	25.1%	20.9%
Cash and Deposits	3.3%	4.5%	2.4%	2.7%	3.5%	4.1%	3.1%	2.3%
CIS ¹⁰	0%	0%	0%	0%	0%	0%	31.3%	32%
Other	27.3%	38.3%	19.8%	19%	0.3%	2.1%	11.5%	11.1%
Panel B. Pension assets as a percent of GDP, 2010 and 2020.								
Total Pension Assets (Millions USD)	2,068,887	3,081,679	1,015,666	2,088,702	75,846	48,934	17 935 858	35,491,205
Pension assets as a % of GDP	62.9%	100.8%	118.9%	212.7%	15.4%	6.5%	73.5%	96.8%
Percent change of pension assets		60.25%		78.9%		-57.8%		31.7%
Total Pension Assets (Millions USD)	2,068,887	3,081,679	1,015,666	2,088,702	75,846	48,934	17 935 858	35,491,205
Panel C. Percentage distribution of pension assets by type of plan.								
Occupational defined benefit	59.8%	60.1%	Over 90%	89.0%	0	0	37.3%	29.9%
Occupational defined contribution	3.7%	3.7%	Less than 10%	11%	1.5%	10.8%	24.7%	27.1%
Personal defined contribution	36.5%	36.2%	0%	0%	98.5%	81.2%	38.1%	43.0%

Source: OECD Global Pension Statistics 2010 and 2020.

¹⁰ **Note:** Collective Investment Schemes (CIS) refer to incorporated investment companies and investment trusts, as well as unincorporated undertakings (such as mutual funds or unit trusts), that invest in financial assets (mainly marketable securities and bank deposits) and/or non-financial assets using the funds collected from investors through issuing shares/units (other than equity). OECD (2009).

Table 2. Asset allocations of Canadian, Dutch and U.S. pension funds to equity, fixed income, private equity, hedge funds, REIT, unlisted REIT, infrastructure and others for 1996, 2006 and 2016

	Canada			Netherlands			United States		
	Panel A. Equally Weighted (%)								
	1996	2006	2016	1996	2006	2016	1996	2006	2016
Equity	51.9	48.0	31.7	36.3	37.0	28.3	53.7	53.7	36.4
Fixed Income	37.0	29.7	26.7	41.6	35.8	40.8	30.7	22.8	23.8
Private Equity	1.6	9.1	15.9	0.8	6.5	8.2	5.0	10.5	16.7
Hedge Funds	0.0	2.0	3.9	0.0	1.8	2.5	0.0	1.4	3.8
REIT	0.0	0.3	0.2	0.9	5.3	4.2	0.1	0.8	0.4
Unlisted REIT	4.7	7.2	13.6	19.3	9.7	9.4	7.3	8.7	13.7
Infrastructure	0.0	1.7	7.4	0.0	0.0	3.2	0.0	0.0	0.7
Others	4.7	2.0	0.6	1.2	3.9	3.4	3.2	2.1	4.5
	Panel B. Value Weighted (%)								
Equity	49.4	42.2	30.2	37.5	34.8	28.2	53.4	52.7	38.9
Fixed Income	38.2	29.7	25.6	40.1	37.0	37.0	31.3	20.6	19.9
Private Equity	2.3	13.4	22.2	1.0	7.1	9.2	4.9	12.5	17.6
Hedge Funds	0.0	2.7	5.1	0.0	1.9	3.7	0.0	1.2	2.5
REIT	0.0	0.3	0.1	0.4	6.8	5.3	0.1	0.7	0.3
Unlisted REIT	5.5	8.0	13.4	20.4	7.6	8.5	7.3	10.7	16.0
Infrastructure	0.0	2.4	6.8	0.0	0.0	4.1	0.0	0.0	0.7
Others	4.5	1.3	-3.2	0.6	4.9	3.9	3.1	1.7	4.2

Source: CEM Benchmarking

Table 3. Investment cost. Assuming that the cost of investing across different asset classes for Canadian funds is always 100 bps in 2016, the table reports the standardized average cost for each asset class. Panel A shows the equal-weighted average cost, and Panel B shows the value-weighted cost of investing. The last row of each panel presents the total cost in bps.

	Canada			Netherlands			United States		
	Panel A. Equally Weighted								
	1996	2006	2016	1996	2006	2016	1996	2006	2016
Equity	45	61	100	54	25	52	41	23	36
Fixed Income	118	82	100	15	68	64	119	130	140
Private Equity	68	114	100	81	85	113	101	127	96
Real Estate	74	77	100	42	72	103	136	124	136
Hedge Funds	0	88	100	0	60	84	0	74	103
Infrastructure	0	114	100	0	305	89	0	130	161
Total (bp)	34	36	51	18	37	35	40	47	61
	Panel B. Value Weighted								
Equity	32	54	100	11	20	28	16	9	14
Fixed Income	49	52	100	16	56	47	68	90	117
Private Equity	63	106	100	119	155	122	99	140	113
Real Estate	69	83	100	81	59	128	115	155	162
Hedge Funds	0	56	100	0	85	91	0	37	105
Infrastructure	0	102	100	0	118	177	0	1	114
Total (bp)	18	39	58	21	31	34	25	40	56

Source: CEM Benchmarking.

Table 4. Country-based cost analysis regressions

The dependent variable is the total investment costs in basis points of Canadian, Dutch and the U.S. pension funds separately. As independent variables, we include the log of pension fund assets in millions of domestic currencies (*LogSize*), the percentage of retired members among all sample Canadian pension funds (*%Retired*); the percentage allocation to externally (*%Ext*) and actively (*%Act*) managed assets. When analyzing the alternatives costs, we also include the percentage of assets allocated to fund-of-funds (*%FOF*) as independent variable. We report standard errors in brackets. *, ** and *** indicate significance levels of 0.10, 0.05 and 0.01, respectively.

	Canadian Pension Funds				Dutch Pension Funds			U.S. Pension Funds		Poland Funds
	Total Costs				Total Costs			Total Costs		Total Costs
<i>LogSize</i>	-5.3714***	-7.0851***	-7.5360***	-6.1116***	-4.3556	-4.6644*	-6.3431***	-6.4002***	-6.0790***	-8.5534**
	1.3112	1.4737	1.4944	2.9781	2.8590	2.8398	0.4394	0.3923	0.3899	4.5182
<i>LogSize</i> × <i>Public</i>	3.3146***	4.6081***	5.0181***				-1.5914***	-0.6451***	-0.6401***	
	1.1110	1.2757	1.2955				0.6231	0.1475	0.1458	
<i>%Retired</i>		-10.6136***	-10.6761***		13.8449**	13.9322**		2.1024	1.9407	
		3.6647	3.6627		7.5977	7.5382		2.0416	2.0227	
<i>%Ext</i>		6.3030***	6.0302***		3.5804	2.6228		1.0592	2.5377*	
		2.5224	2.5256		2.7104	2.7215		1.5595	1.5545	
<i>%Act</i>		18.0591***	18.3369***		14.8939***	15.8516***		24.4016***	24.7109***	
		2.1848	2.1890		2.5786	2.5924		1.3311	1.3194	
<i>%FOF</i>			28.8544**			-40.8400***			49.5133***	
			16.1645			17.8643			5.7236	
<i>%Equity</i>	-64.2571***	-76.7311***	-77.7683***	-2.2909	0.8946	1.2361	-78.1118***	-90.4500***	-90.8437***	
	5.6411	6.4402	6.4625	14.9123	15.0801	14.9624	2.9484	3.0335	3.0066	
<i>%FixedIncome</i>	-90.2163***	-98.4948***	-99.3819***	-56.9559***	-50.3033***	-54.6804***	-93.5860***	-112.2473***	-113.0668***	
	5.8230	6.4596	6.4749	13.8286	13.8057	13.8305	3.2693	3.3737	3.3446	
<i>%PE</i>	102.4841***	114.6616***	106.4428***	119.9582***	140.8041***	150.8786***	91.5529***	94.0234***	84.2401***	
	10.0284	11.7719	12.6338	22.1539	22.2913	22.5511	4.9285	5.0116	5.0952	
<i>%RealEstate</i>	-41.1965***	-59.0926***	-61.7612***	-3.7918	-4.0966	-7.4591	-10.9590**	-28.6036***	-29.3374***	
	9.2943	10.3647	10.4659	17.6963	18.0079	17.9270	5.2485	5.3591	5.3113	
<i>%Infra</i>	7.2045	2.7059	-0.4349	-31.1677	-8.9606	-5.4068	34.2362*	50.0056**	40.9760***	
	11.8514	13.3896	13.4969	45.0652	46.6971	46.3565	20.4068	20.2209	20.0707	
<i>Public</i>	-6.7686						7.3415			
	14.1866						5.2077			
<i>DB plans</i>		2.2501***	2.0827	0.6260	-1.0147	-0.6113		0.0384	0.1505	
		1.0094	1.0132	1.3646	1.4267	1.4264		0.6390	0.6336	
<i>R²</i>	0.7391	0.7387	0.7392	0.8712	0.8932	0.8953	0.6711	0.7085	0.7199	0.8077
<i>Obs</i>	2,453	2,121	2,121	394	365	365	4,533	4,129	4,129	70
<i>NO. Funds</i>	256	235	235	73	66	66	600	553	553	10
<i>Fund FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5. Comparative analysis of investment cost. The dependent variable is the total investment costs in basis points of Canadian, Dutch and the U.S. pension funds separately. As independent variables, we also include the country dummies in addition to the independent variables shown in [Table 4](#). Note: F.E. refers to fixed effects.

	<i>Dependent Variable is Total Cost in BP</i>				
<i>U.S.</i>		7.0309***			
		0.8927			
<i>Canada</i>	-6.6189***				
	0.9506				
<i>Netherlands</i>	-9.8261***				
	1.6497				
<i>Poland</i>					28.2388***
					7.3164
<i>LogSize</i>	-5.4096***	-5.9636***	-5.1872***	-5.2227***	2.7201***
	0.2866	0.2690	0.2690	0.2707	0.2468
<i>LogSize × Pub</i>	-0.6173***				
	0.1172				
<i>%Ext</i>	6.4641***	6.8065***	7.0399***	7.1473***	
	1.0614	1.0626	1.0529	1.0569	
<i>%Act</i>	19.4884***	19.5631***	20.0105***	19.9456***	
	0.9467	0.9468	0.9459	0.9488	
<i>%FOF</i>	48.5501***	48.7156***	50.9877***	50.5293***	
	4.8710	4.8731	4.8558	4.8651	
<i>%Equity</i>	-83.0448***	-83.3131***	-84.1508***	-83.8905***	
	2.4488	2.4529	2.3670	2.3729	
<i>%FixedIncome</i>	-104.1920***	-104.4925***	-106.5626***	-107.2418***	
	2.6580	2.6550	2.5136	2.5201	
<i>%PE</i>	91.9231***	91.4966***	100.5978***	87.7654***	
	4.2444	4.2480	6.8575	4.2898	
<i>%PE × US</i>			-14.1422***		
			6.6124		
<i>%PE × Can</i>				19.0895***	
				7.1642	
<i>%RealEstate</i>	-37.1947***	-38.8479***	-72.2284***	-30.1269***	
	4.1411	4.1237	5.5216	4.4590	
<i>%RealEstate × US</i>			50.5935***		
			5.9474		
<i>%RealEstate × Can</i>				-40.2040***	
				6.5057	
<i>%Infra</i>	8.9046	9.0883			
	7.5444	7.5494			
<i>Public</i>			-5.4388***	-4.8826***	
			0.9515	0.9567	
<i>R²</i>	0.6765	0.6718	0.6775	0.6728	0.1358
<i>Obs</i>	7,380	7389	7380	7380	7441
<i>NO. Funds</i>	929	929	929	929	936
<i>Fund FE</i>	No	No	No	No	No
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes

Figure I. Equally weighted asset allocation of three countries' pension funds

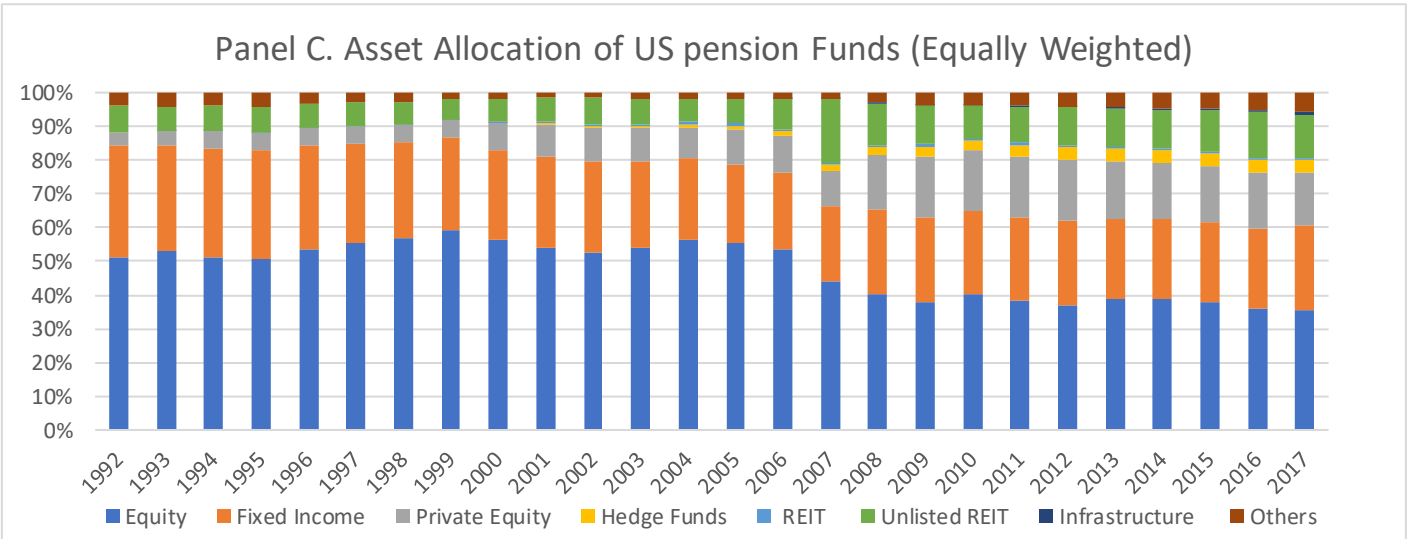
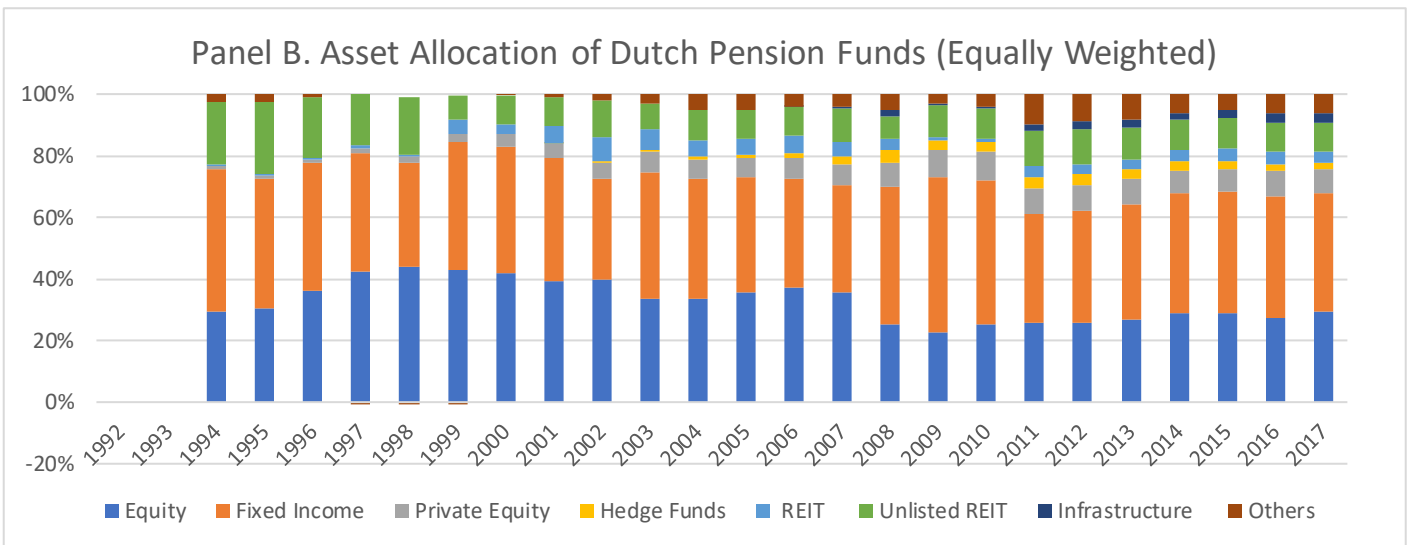
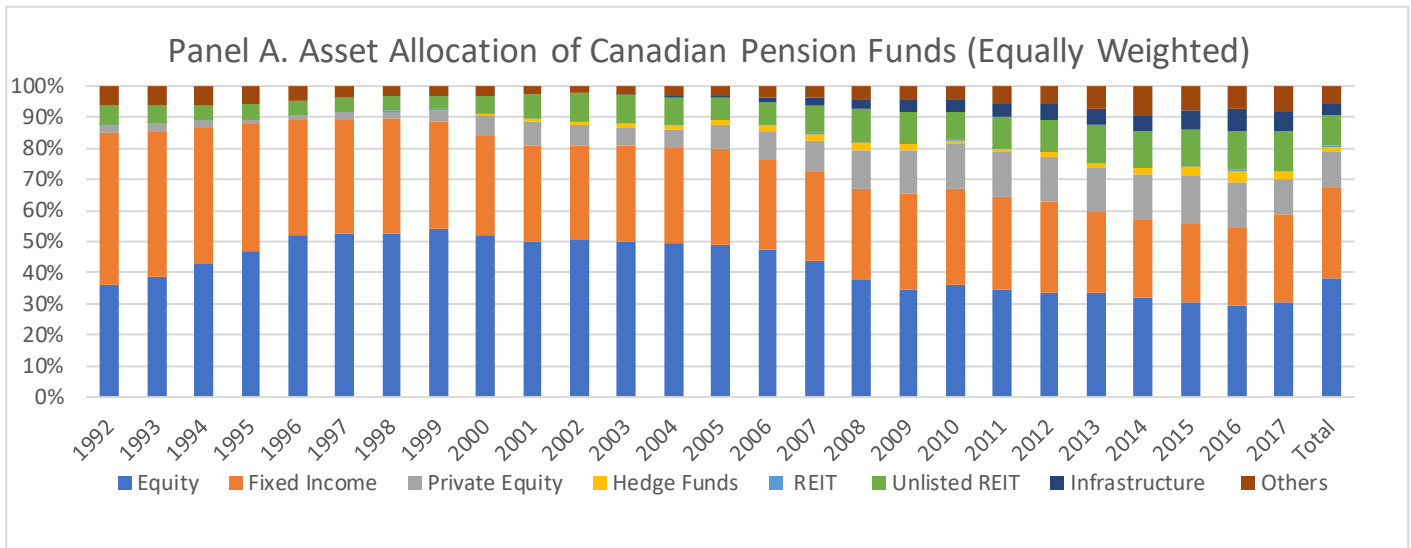


Figure 2. Value-weighted asset allocation of three countries' pension funds

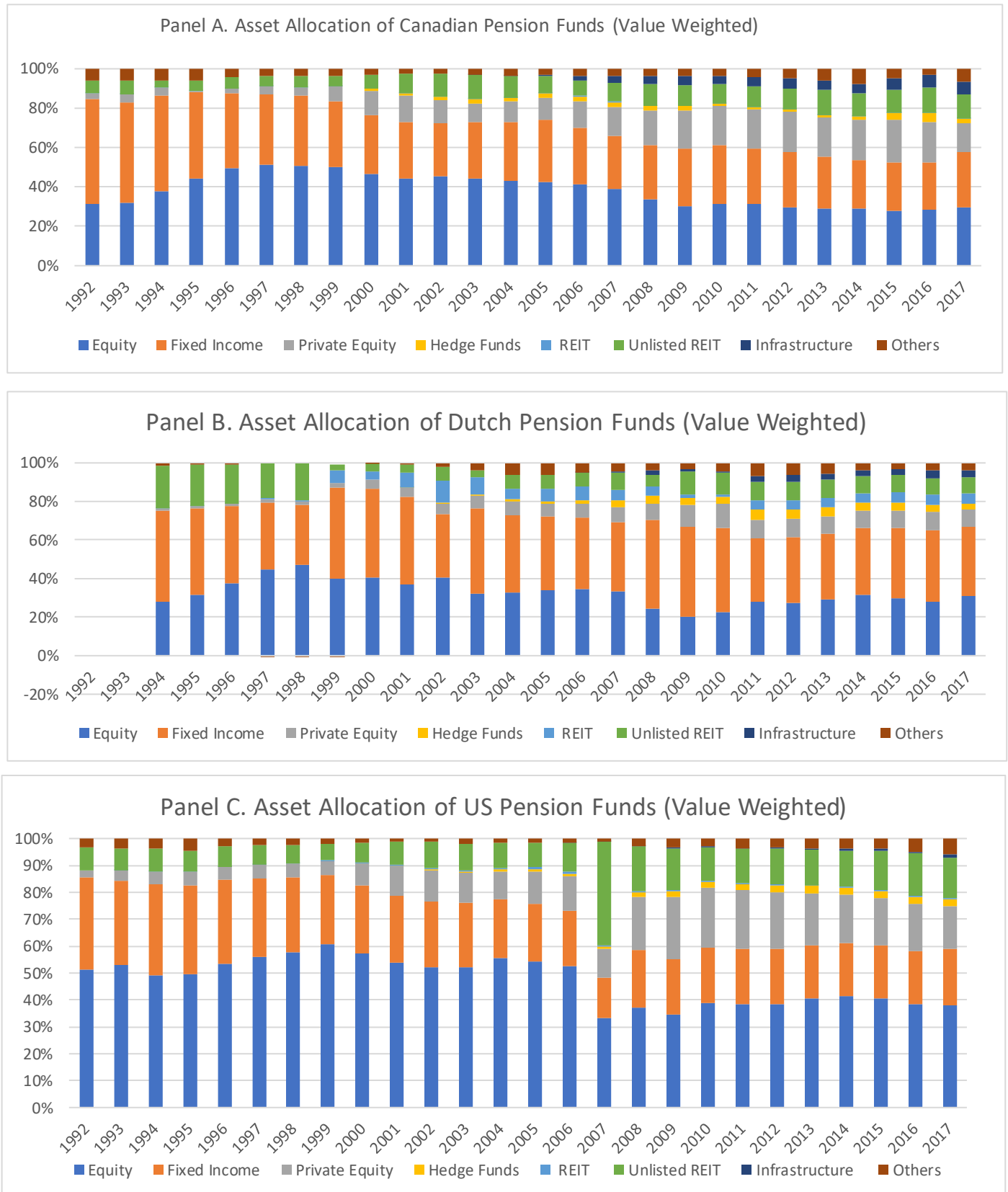


Figure 3. Country comparison of annual average investment cost on an overall fund level.

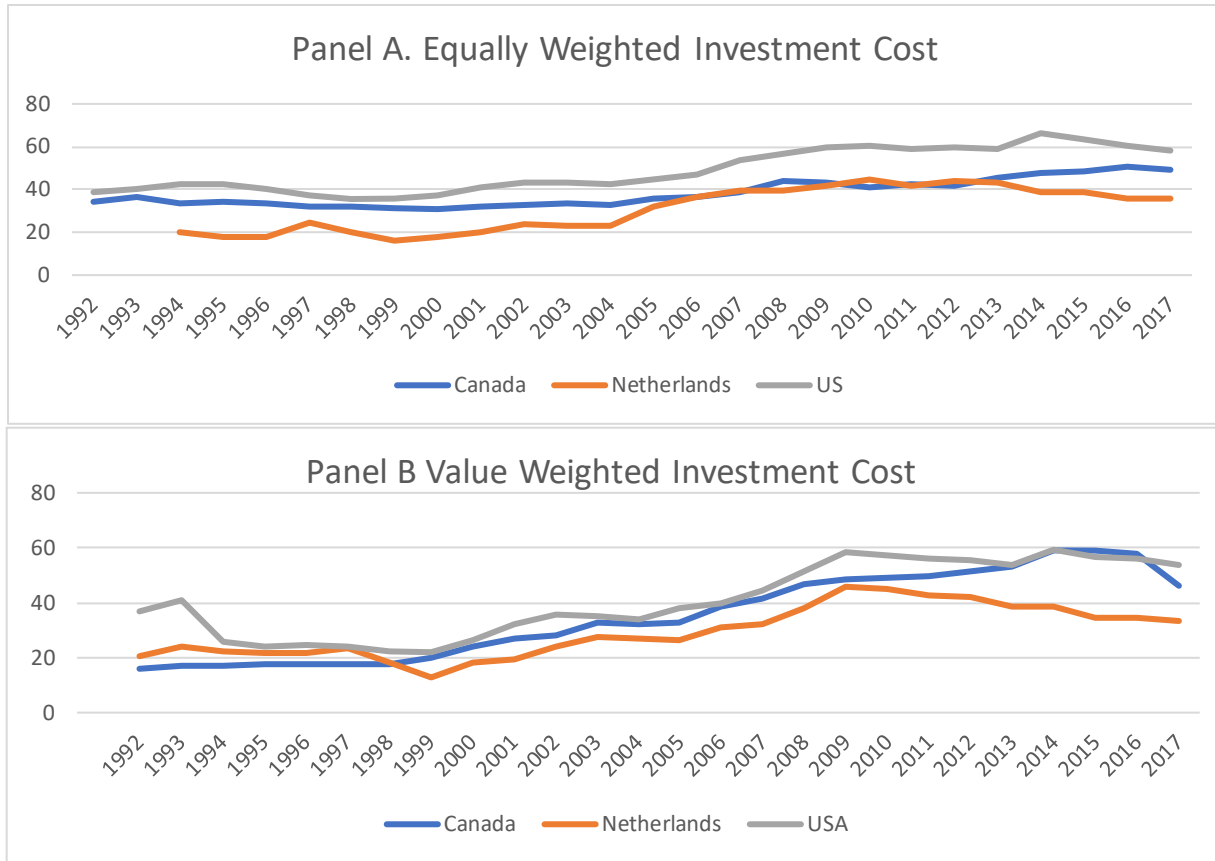


Figure 4. Investment cost public vs corporate pension funds (equally weighted)

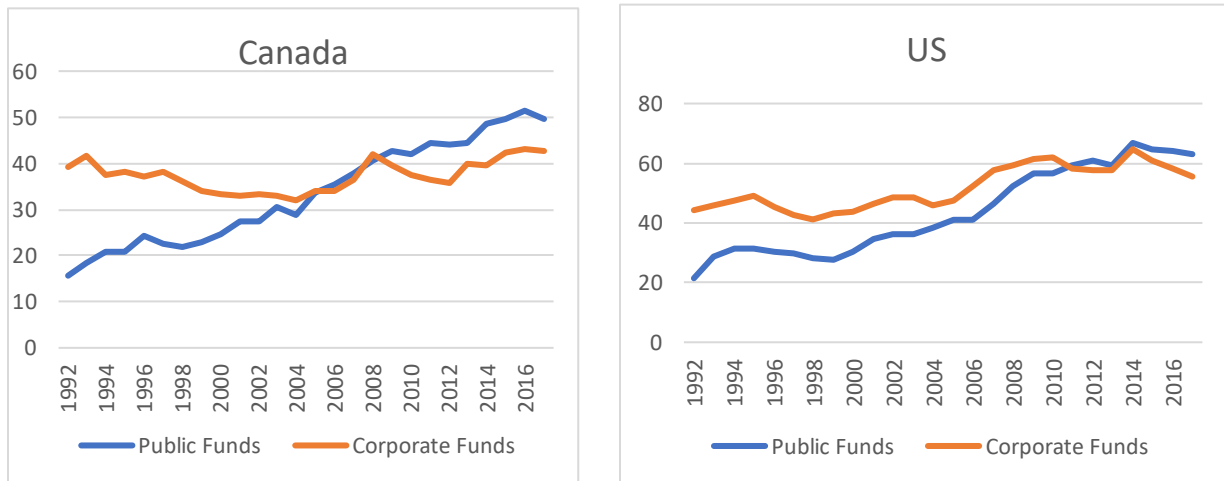


Table A 1. Summary statistics This table shows the number of pension funds in Canada, the Netherlands, and the United States in the CEM database for 1992-2017. The "Public" column presents the number of public funds. The "Mean," "Min," and the "Max" columns show the average, minimum, and maximum fund sizes of the underlying countries using the local currency.

Year	Canada					Netherlands					United States					Total	
	Funds	Public	Mean	Min	Max	Fund	Public	Mean	Min	Max	Fund	Public	Mean	Min	Max	Funds	Public
Millions CAD			Millions EUR			Millions USD											
1992	81	13	2,071	20	41,307						82	18	7,766	106	71,891	163	31
1993	86	15	2,400	29	47,117						133	40	6,357	114	79,670	219	55
1994	98	23	2,195	27	44,860	3	0	12,722	7,320	22,937	167	53	4,888	116	78,145	268	76
1995	102	25	2,605	30	51,185	4	0	11,044	2,774	25,674	191	71	6,265	153	96,801	297	96
1996	105	28	2,993	33	57,214	5	0	11,961	3,146	29,808	184	63	6,591	100	108,117	294	91
1997	97	31	3,817	35	64,438	7	0	10,806	2,245	35,166	167	64	8,391	112	128,239	271	95
1998	104	30	3,884	37	68,550	6	0	13,754	2,477	40,996	173	69	9,777	127	151,767	283	99
1999	110	30	4,049	37	81,066	11	0	25,728	2,924	147,499	181	83	11,197	129	171,944	302	113
2000	105	29	4,371	80	88,339	11	0	26,545	2,834	150,170	165	82	11,884	117	164,448	281	111
2001	99	31	4,615	78	85,213	11	0	25,635	2,535	147,303	177	83	10,187	26	151,786	287	114
2002	98	28	4,024	77	77,682	11	0	23,643	2,092	135,607	156	74	10,255	65	140,542	265	102
2003	96	27	4,605	82	89,398	13	0	23,113	1,838	150,284	158	74	12,282	54	161,378	267	101
2004	95	25	5,198	89	104,083	10	0	31,050	2,578	168,104	167	76	12,838	39	182,889	272	101
2005	107	35	6,596	19	127,784	15	0	25,351	292	190,600	157	72	13,532	225	200,879	279	107
2006	102	31	8,209	118	142,235	17	0	25,737	1,172	208,900	148	69	16,516	251	231,988	267	100
2007	100	32	8,840	103	155,350	16	0	30,132	1,184	216,600	218	80	13,182	92	253,014	334	112
2008	90	32	7,999	124	120,100	10	0	24,973	81	172,105	214	72	10,872	63	183,323	314	104
2009	93	30	8,350	55	131,600	9	0	10,038	1,149	32,829	208	73	12,649	89	203,317	310	103
2010	95	30	9,912	133	151,742	13	1	7,633	36	37,438	206	73	13,702	37	225,699	314	104
2011	89	30	11,239	150	158,965	42	0	13,986	164	244,491	204	68	14,924	44	224,975	335	98
2012	89	29	12,240	64	176,210	29	0	23,310	209	279,271	203	70	16,601	51	248,773	321	99
2013	90	30	13,961	191	201,500	39	0	19,479	228	298,562	193	68	19,085	156	283,552	322	98
2014	89	33	16,106	208	238,788	30	1	28,699	319	343,540	178	68	20,855	355	295,821	297	102
2015	80	31	18,973	98	282,571	34	0	25,983	319	350,913	176	64	20,313	154	289,859	290	95
2016	80	32	20,780	111	298,081	24	0	36,926	371	381,467	170	60	21,512	158	302,793	274	95
2017	73	29	16,988	84	298,746	24	0	38,803	403	391,674	157	58	23,486	236	349,987	254	87
Obs.	2,453	739				394	2				4,533	1,745			7,380	2,486	
Funds	256	61				73	1				600	184			929	246	

Table A2. Survey of pension structure: Netherlands, Canada, Poland, and the United States

Country	Mercer Rating	Basic Description
Netherlands	A	Flat-rate public pension and quasi-mandatory earnings related-private pension
Canada	B	Flat-rate pension plus means tested supplement; earnings related pension and voluntary schemes
United States	C+	Earnings related Social Security and means tested supplement; voluntary private pensions, both employer-based and individual
Poland	C	Minimum public pension and earnings-related system with notional accounts. Voluntary employer sponsored pensions, co-financed by employers and employees with subsidies from the state, and individual pensions

Source: Derived from Mercer (2020)

Annex 1: Synopsis of the Four Countries' Pension Systems

Knowledge of the components of employer-provided and individual account pension plans in our four OECD countries can provide a foundation to understand how different legal and regulatory structures may influence pension fees. To this end, we provide a short synopsis of the funded and unfunded elements in each system and their relative importance for plan participation and income at retirement. Mercer (2020) reviews the structure of pensions in 39 countries includes the Netherlands, Canada, Poland and the United States. Their analysis focuses on three characteristics that define a country's pension system: (i) adequacy; (ii) sustainability, and (iii) integrity ([Table A2](#)).

Insert [Table A2](#) here.

In terms of replacement rates, the Dutch pension system basically provides a replacement rate of 69 percent of the earnings of the average worker, as the funded system covers virtually most of the labor force. By contrast, the mandatory system in Canada provides a replacement rate of 38.8 percent for the average worker, although the replacement rate for participants covered by funded pension plans increases that to 63 percent. The mandatory Social Security system in the United States offers a basic replacement rate of 39.2 percent to the average worker. With additional funded coverage, however, the average worker may have a replacement rate of over 80 percent. The mandatory Polish system provides a replacement rate of 30.6 percent for the average worker (OECD 2022). Mandatory retirement scheme replacement rates for the average worker everywhere except the Netherlands range from 30 to 40 percent. This underlies the size and importance of voluntary occupational and individual pension funds in each country.

Detailed country-specific information helps to provide a more nuanced view of the way in which systemic differences might impact fee structure, investment policies, and rates of return. Such differences include the relative size of the system, the proportion of mandated to non-mandated pensions, the mix of defined benefit and defined contribution plans, and a number of other country-specific features.

Netherlands. The pension system in the Netherlands has three main pillars: a flat rate state pension (AOW) related to minimum wages and financed via payroll taxes, funded occupational pension schemes, and individual saving schemes. Although there is no statutory obligation for employers to offer a funded pensions to their employees, industrial-relations agreements cover approximately 90 percent of employees. These schemes are best thought of as quasi-mandatory. (OECD 2021)

In 2022, defined benefit plans were predominant. However, this is likely to change in the future as a 2019 Pension Agreement concluded by employers, unions, and government recommended transforming the defined benefit system into one of either defined contribution or hybrid DB-DC plans. The reason for this legislative change was that low interest rates and population aging were increasing the cost of the defined benefit plans (Demtons 2022). The agreement has been drafted into legislation, which parliament will vote on in 2022.¹¹ However, due to legislative delays, the bill probably will not be passed in 2022 and the scheduled date for the legislation to be effective has been postponed to July 1, 2023 (Gray 2022). Following passage of that legislation, pension funds will have four years to switch to the new system. The level of contributions will be set under the new system, as well as target benefits. Periodically, employers and employees will decide whether the contribution rate needs to be adjusted to meet the target benefit level (Jaarsma 2022).

Canada. The Canadian pension system offers a universal flat rate benefit through the Old Age Security Program (OAS) that can be topped up with an income-tested benefit, earnings-related public schemes and voluntary private pensions. Earnings-related benefits are provided through the Canada Pension Plan (CPP), which covers virtually all employed and self-employed persons in Canada excluding Quebec. The Quebec Pension Plan (QPP) is a provincially run public plan similar to the CPP. These two plans are partially funded and are the largest two pension plans in terms of assets in Canada.

In Canada, defined benefit plans are the main type of funded employer-provided pension. In 2019, 66 percent of participants covered by employer-provided pensions were in defined benefit plans (4.3 million), 19 percent (1.2 million) in defined contribution plans, and 15 percent

¹¹ As of September 2022, that vote has not yet occurred.

(1.0 million) in hybrid plans (Statistics Canada 2021). In addition, in 2020, some 6.2 million Canadians contributed to Registered Retirement Savings Plans (RRSP), established as individual accounts (Statistics Canada 2022). RRSP plans were the most common type of funded plan in terms of the number of participants.

Poland. A nonfinancial defined contribution (NDC) program is the first pillar of the Polish old-age pension system. It is managed by the Social Insurance Institution (ZUS) and is based on a system of notional accounts. Notional accounts are unique among the four countries we are assessing and may be a result of Poland's more recently developed system. Initially, workers born in 1969 or later were required to participate in the funded scheme; while those born between 1949 and 1968 could choose which option they preferred – funded or unfunded. Since 2014 participation in the funded scheme is entirely voluntary and participants must opt in to be included (OECD 2019). Workers who opt-in can allocate 2.92% of their gross wages to the privately DC scheme (OFE) managed by pension fund companies (PTE). Employer-provided collective plans and voluntary individual plans form the third pillar (Mączyńska et al., 2021). Third-pillar collective plans, introduced in 1999, are offered as employee pension programs (pracownicze programy emerytalne, or PPE in Polish) and employee capital plans (pracownicze plany kapitałowe, or PPK).

Third-pillar individual pension saving schemes are available as voluntary individual retirement accounts (indywidualne konta emerytalne, or IKE in Polish) and individual retirement security accounts (indywidualne konta zabezpieczenia emerytalnego, or IKZE in Polish, and were introduced in 2004 and 2012, respectively. At the end of 2020, the IKEs covered 4.3 percent of the working population, and the IKZEs covered 2.4 percent.

United States. The foundation of the United States pension system is a contributory pay-as-you-go Social Security benefit that provides a progressive replacement rate at the time of retirement. A means-tested benefit through Supplemental Security is available for those who do not qualify for Social Security. These benefits are adjusted annually for inflation.

Funded employer-sponsored defined benefit and defined contribution plans, on a mandatory or voluntary basis, supplement the floor of protection provided by Social Security. In addition, employees may contribute to Individual Retirement Accounts (IRAs). Among all private-sector workers, 68 percent had access to either a defined benefit or defined contribution plan (or both) in 2021. These all contribute to the U.S. funded pension system. Among workers with funded pension benefits, 15 percent had access to a DB plan, 65 percent had access to a DC plan, some had access to both (Congressional Research Service 2021).¹²

A trend in the U.S. retirement system over the past five decades is the shift away from defined benefit (DB) pension plans to defined contribution (DC) plans. This shift is probably a result of factors including full employer funding of DB plans compared to the sharing of DC contributions costs by employers and employees. In sum, the risk and cost of funding DB plans falls primarily on employers, while the retirement-income risk and cost of funding associated with DC plans also falls on employees.

IRA assets are larger than those of other funded plans (Investment Company Institute 2022b). When workers leave employment with a 401(k) plan, the most common type of employer-provided DC plan, they often roll their assets over to an IRA. The same type of rollover often occurs at retirement. In 2019, \$554 billion was rolled over to IRAs, compared to \$76 billion of new contributions (Investment Company Institute 2022b).

¹² Workers in state and local governments may have pensions provided through their employment. Their pensions may or may not be integrated with Social Security and may or may not be funded.