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THE LABOUR MARKET IMPACTS OF EMPLOYER-PENSION PLANS§

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Abstract. This paper leverages an original linkage between data from the Pension Plans in Canada (PPIC)—a census of all employer pension plans in Canada—and tax data on employers and employees from the Canadian Employer-Employee Dynamic Database (CEEDD) to examine three interrelated questions. First, how have pension plans and coverage evolved between 2001 and 2020? Second, how much do workers value jobs with pension plans? Third, how do these pensions impact employee mobility? Additionally, we analyze how these effects vary depending on the characteristics of the pension plan, such as defined benefit versus defined contribution plans, profit-sharing arrangements, and other structural differences.

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1. Introduction

This paper addresses three related questions about pension plans in Canada. First, how have the characteristics and coverage of pension plans evolved between 2001 and 2020? Second, how much value do workers place on employment offering pension coverage? Third, what impact do these pension plans have on employee mobility?

In Canada, public pensions provide relatively lower retirement replacement rates compared to most other OECD countries (OECD, 2017), leading workers to rely more heavily on private retirement savings, such as employer-sponsored pension plans. Understanding which firms offer Registered Pension Plans (RPPs), the characteristics of these plans, their evolution over time, and the influence of public policy is therefore crucial. Such analysis can highlight important gaps in pension coverage across Canadian society and inform the development of effective pension legislation.

Most existing academic evidence on these questions is based on survey data for the United States. With respect to pension coverage, these studies show that (i) pension coverage is higher among higher earners, individuals in larger firms and union-covered workers and (ii) there has been a large shift in the types of plans, from Defined Benefit (DB) to Defined Contribution (DC) plans (for reviews, see Gustman et al., 1994, Dorsey, 1995, Aaronson and Coronado, 2005). However, these findings are of limited relevance for Canada, where the shift towards DC plans has been slower and DB schemes remained until recently, by some margin, the most common type of plan (Gougeon, 2009, Baldwin, 2015).[1]

Despite the importance of retirement benefits in shaping household wealth, relatively little is known about how individuals value these benefits. This knowledge gap stems from both the scarcity of representative data that jointly captures pensions and wages, and the methodological challenges involved in estimating pension plan values from survey data. As reviewed by Haynes and Sessions (2013), prior studies report mixed findings. For instance, Gustman et al. (1994) documents a positive relationship between earnings and pensions, whereas Smith and Ehrenberg (1983) finds a negative one. Using data from the British Household Panel Survey, Haynes and Sessions (2013) find no evidence of a wage–pension trade-off.

Another strand of the literature seeks to uncover how workers value pensions by using surveys that elicit individuals' willingness to pay for varying levels of retirement benefits. These studies consistently find evidence of a trade-off between earnings and pensions. For example, Cole and Taska (2023) show that the average U.S. worker is

[1]Munnell et al. (2024) provide some anecdotal evidence that the shift to DC plans in the U.S. may be slowing down.

willing to give up approximately 3.4% of total compensation for access to a 401(k) plan at the extensive margin—even when the plan offers no employer match. Additionally, workers are willing to forfeit about 0.5% of total compensation for each 1% increase in employer matching. Similarly, Fuchsman et al. (2023) find that U.S. teachers value pensions, though less than other components of compensation, such as health insurance and Social Security enrollment. Fitzpatrick (2015) also finds that U.S. teachers are willing to accept lower salaries in exchange for more generous pension benefits.

In terms of estimating the impact of pensions on mobility, most of the literature is in agreement in finding that pensions plans do reduce mobility (see, for example Gustman and Steinmeier, 1993, Goda et al., 2017, Fang and Messacar, 2019) although there is some disagreement about the relative impacts of DB versus DC plans. Moreover, most of this existing evidence uses either very specific sub-populations, or limited survey data.

This paper draws on novel administrative data, an original linkage between data from the Pension Plans in Canada (PPIC)—a census of all employer pension plans in Canada—and tax data on employers and employees from the Canadian Employer-Employee Dynamic Database (CEEDD) to shed new light on pension coverage in Canada. We extend the literature by documenting how pension plan coverage evolved over the 2001-2020 period and examining the implications for workers.

Our estimates suggest that private-sector pension coverage is lower than typically reported in official statistics. We also find that workers place substantial value on pension coverage: in the private sector, the implicit valuation is approximately 6.3 percent of earnings. Finally, we show that pension plans reduce labor market mobility, with estimated reductions in mobility ranging from 35 to 70 percent, depending on the type of plan. The largest effects are observed among workers covered by Defined Benefit (DB) plans.

2. Data: Pension plans in Canada

This study relies on detailed, longitudinal, linked employer-employee microdata. Our primary data source is the Canadian Employer-Employee Dynamics Database (CEEDD) from 2001 to 2020, a longitudinal linkage of the universe of tax records from both individuals (T1 tax forms) and firms (T2 tax forms), as well as employment records (T4).

To identify pension coverage, we link CEEDD to the Pension Plans in Canada (PPIC) census—a comprehensive register of all Registered Pension Plans (RPP) in Canada. Throughout this study, we use the term RPP to refer to employer-sponsored plans

registered with the Canada Revenue Agency, and in most cases, with a provincial or federal pension supervisory authority. These plans are designed to provide a regular stream of income upon retirement.

A key component of our work involves linking pension plan information from the PPIC to individual T4 employment records in CEEDD. This linkage uses the pension plan number reported on T4 forms and attempts to match it to two identifiers in the PPIC dataset: the "RCNum" and the "planregnum". However, the linkage process is complicated by known inconsistencies in the pension plan number field on T4 forms, including missing or extra digits.

In the first step, the pension plan number from the T4—referred to as "pensnum"—is matched directly to the "RCNum" field in PPIC. This is the most frequent and reliable form of match. In the second step, "pensnum" is instead matched to the "planregnum" field, which produces better results for certain records.[2]

Table 1 reports the share of pension plan members for whom a valid link to T4 records was established using the first two steps. The match rate improved from 89.5% in 2001 to 96.7% in 2020. Despite inconsistencies in plan identifiers, the resulting linkage is highly reliable across the period and forms the empirical foundation for the analysis that follows.

3. Pension plan coverage in Canada

Figures 1 and 2 document the evolution of pension plan participation in Canada between 2001 and 2020 using PPIC data. The total number of registered pension plans increased steadily until around 2010, after which it began a gradual decline. Figure 3 presents the distribution of pension plans by size, measured by the number of registered members. While not shown in the figure, a small number of large plans—those with over 5,000 members—account for a substantial share of coverage and are primarily associated with public sector employment.

Pension coverage in Canada is typically reported as the ratio of active registered participants to the employed population. Official estimates from Statistics Canada are

[2]Two other steps were tried to improve the linkage. The third and fourth steps attempt to correct for minor digit errors. In step three, if the T4 value appears to be missing a final digit, the last digit was dropped from the "RCNum" in PPIC to attempt a match. In step four, if the T4 field includes an extra digit, the last digit is dropped from "pensnum" before attempting the match. Following validation exercises, matches from steps three and four are discarded due to quality concerns. While these adjustments marginally increased the overall matching rate—by between 0.5 and 2 percentage points over the sample period—they introduced unreliability, with many links failing to reflect true plan affiliations. To preserve data quality, only the matches from steps one and two are retained in the final dataset.

based on the number of active members in the Pension Plans in Canada (PPIC) census (excluding participants from the Northwest Territories, Yukon, Nunavut, and outside Canada),[3] divided by total employment as measured in the Labour Force Survey (LFS), including public and private sector employees as well as incorporated self-employed workers.[4]

Two adjustments are made to these official coverage rates. First, one needs to account for members of the armed forces, who appear in the PPIC but are excluded from the LFS sample. Second, adjustments for the exclusion from the LFS of individuals residing on reserves and other Aboriginal settlements, who are nonetheless included in the PPIC, are applied. These corrections improve comparability between the numerator and denominator in the coverage rate calculation.

Using this methodology, Figure 4a shows the aggregate pension coverage rate from 2001 to 2020 using PPIC data, while Figures 4b and 4c present the rates separately for the public and private sectors. On the one hand, coverage is consistently higher in the public sector, and slightly increasing over the period 2001-2020. On the other hand, workers in the private sector seem to experience a secular decline in coverage over the same period.

There are reasons however to doubt these official figures are really typical of the experience of the average worker in the private sector in Canada. For instance, an individual holding two pension-covered jobs will be counted twice in the PPIC census but only once in the LFS. Similarly, workers who switch between two pension-covered jobs in the same year may also be double-counted in the PPIC. Also, workers on temporary leave (e.g. maternity leave, temporary layoff) will be counted as PPIC pension plan members but will not receive a salary (hence a T4).

To assess the magnitude of these potential biases, we construct an alternative private sector sample using our linked between CEEDD and PPIC data.[5] We retain only the highest-paying job for each individual, restrict the sample to workers aged 25 to 54, and exclude individuals earning less than $12,000 annually.[6] Figure 5 presents the resulting coverage estimates for the private sector over the same period.

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[3]PPIC – Table 11-10-0133-01

[4]LFS – Table 14-10-0027-01

[5]The sample for the private sectors excludes workers in NAICS 61 (Educational services), 62 (Health care and social assistance), and 91 (Public administration).

[6]These restrictions are used to get a sample more likely to work full-time and abstract from school-work and work-retirement transitions. Note that for earnings, the restriction is applied after deflating all figures to 2012 $.

Two findings emerge. First, in every year, the unadjusted PPIC coverage rate exceeds our CEEDD-based estimate, suggesting that the official figures overstate the true prevalence of pension coverage among core-age private-sector workers. The discrepancy is largest in the early 2000s. Second, the downward trend in pension coverage seen in Figure 4c is considerably attenuated in our adjusted sample: the rate declines only modestly, from 18% in 2001 to 17% in 2020.[7]

While further work is needed to fully explain the discrepancy between the official and adjusted figures, Figure 6 presents the results of a simulation that assumes PPIC members with no link to T4 job data are nonetheless covered by a pension, based on the matching rates reported in Table 1. The share of unmatched PPIC members from the private sector in Table 1 rises from 85 percent to around 90–91 percent, stabilizing at that level by the middle of the period.

With those assumptions, the simulation shows a rising match rates over time, recovering the declining trend in pension coverage observed in the PPIC data. However, the finding of a lower coverage rate in the private sector remains. Notably, the discrepancy between the PPIC-based coverage rate and that derived from our matched sample grows over time. A plausible explanation is that individuals are increasingly double-counted in the PPIC—either because they hold multiple jobs or switch employers within the same year—reflecting a rise in labor market instability.

3.1. **DC versus DB coverage in the private sector.** The Pension Plans in Canada (PPIC) dataset classifies pension plans into ten distinct types, as detailed in Section A. Table 2 maps each plan type into one of three broad categories: Defined Benefit (DB), Defined Contribution (DC), or Other. Figure 7 shows the share of private-sector employees covered by a DB, a DC and by other types of plans in our sample. While the total number of plans classified as DB has declined since the early 2000s, the share of DC and other types of plans has risen correspondingly. The share of workers in the private sector covered by a DB plan indeed declined sharply—from 70% in 2001 to 39% in 2020. Most of this decline occurred between 2007 and 2015, after which the coverage rate stabilized around 40%.

Among workers covered by a DB plan, plan types vary in structure and generosity. Approximately 30% were enrolled in *Average Best Earnings (total tenure)* plans, a figure that remained relatively stable over the sample period. The share covered by *Average Best Earnings (best years)* plans fell from 15% in 2001 to 8% in 2020. In

[7]Adding younger workers (under 25) or older workers (55 and above) to the sample has only a minor impact on overall coverage: the estimate falls by about 1 percentage point when including younger workers and rises by roughly the same amount when older workers are added.

contrast, *Flat Benefit* plans have become increasingly dominant, accounting for 41% of DB-covered workers in 2001 and 51% in 2020.

Figure 7 shows the corresponding rise in coverage by DC plans in our sample, from 26% in 2001 to 40% in 2020. The vast majority of DC-covered workers are enrolled in *Money Purchase* plans. Plans classified as *Profit Sharing* plans remain very rare throughout the period.

Finally, the increase in DC coverage does not fully offset the decline in DB coverage. As Figure 7 shows, the share of workers covered by "Other" types of plans rose from 4% in 2001 to 20% in 2020. This shift is largely driven by the emergence of *Defined Benefit / Defined Contribution (DB/DC)* hybrid plans. These began to appear in 2005, accounting for 11% of workers in the "Other" category that year. By 2020, they made up 89% of this group.

These trends in our sample are mirrored in the aggregate PPIC data. For example, according to Statistics Canada (2024), among all private sector workers with a registered pension plan, the share covered by DB plans declined from 73% in 2002 to 41% in 2022. Over the same period, DC coverage rose from 23% to 35%, and coverage by other plan types increased from 4% to 25%. Despite differences in data sources and sample construction, both the matched CEEDD-PPIC sample and the aggregate PPIC data indicate a marked shift away from DB plans toward DC and hybrid arrangements.

4. Trade-off between pension plans and earnings in the private sector

Is there a trade-off between pension benefits and earnings? This question is of fundamental importance when thinking about the welfare consequences of pensions. In the cross-section, individuals with higher earnings are more likely to be covered by an employer-pension. However, there are good reasons to think this relationship is purely correlational, since larger and higher paying firms are more likely to provide such pensions.

Assigning values to job amenities such as pensions, the possibility of remote work, or health insurance has a long tradition in economics starting with Rosen (1986). Despite the importance of retirement benefits to household wealth, there is little recent evidence on how individuals value these benefits (Cole and Taska, 2023). Since our measure of pension benefits is simply an indicator of pension coverage, we estimate the trade-off between pensions and earnings, with a similar model to Gustman and Steinmeier (1987), Pozzebon and Mitchell (1989), and Even and Macpherson (1990)

Let w_{it} be annual real earnings for worker i at time t. We then have:

$$ln\, w_{it} = X_{it}\beta + \tau pension_{it} + \theta_i + \varepsilon_{it} \tag{4.1}$$

where θ_i represents an unmeasured time-invariant worker-specific component, X_{it} is a set of observable characteristics about the worker including age, gender, marital status, and ε_{it} represents a time-varying transitory component of variance. The coefficient of interest is τ that represents the impact of pension type for worker i in firm j on earnings. It is expected to be negative if workers pay for pensions through lower earnings. All regressions include controls for province and year.

We estimate equation (4.1) using the previously described sample of private sector workers in which we retain only the yearly highest-paying job for each individual, restrict the sample to workers aged 25 to 54, and exclude individuals earning less than $12,000 annually (in 2012 dollars) for the previously explained reasons. The average worker in this sample is 40 years old, 60% male, 50% married, and earns on average $46,000 (in 2012 dollars).

We could estimate equation (4.1) by ordinary least squares (OLS). As previously noted, this estimate likely reflects upward bias due to positive selection: higher-ability or more experienced workers may be more likely to sort into jobs that offer pensions. Similar patterns of selection have been documented in the U.S. context by Gustman et al. (1994) and Dorsey (1995), underscoring the need for more robust identification strategies. Indeed, the OLS pension coefficient is estimated to be 0.374, meaning that workers with pension earn on average 45% more than workers in job without pensions.

It is worth noting that even adding worker fixed effects will not be sufficient to address this bias as this specification still relies on the assumption of strict exogeneity of job changes. If mobility decisions are correlated with transitory shocks to earnings or preferences, a FE estimator may remain biased. Still, taking into account worker heterogeneity with fixed effects does attenuate the previously noted OLS bias, yielding an earnings premium of 11% for workers in jobs with pension coverage.[8]

We therefore turn to a first-differences (FD) estimator, reported in the first column of Table 3, which is robust to violations of the strict exogeneity assumption. This specification compares earnings changes among workers who switch between jobs with and without pensions, providing an arguably more convincing estimate of the compensating differential. While we do not explicitly model the selection of workers into jobs, we still do take into account worker unobserved heterogeneity in this specification by including worker specific fixed effects. Moreover, our data covering the universe of workers in

[8]Also, both wage setting and benefit policy may suffer from an endogeneity concern: the way that firms set wages and retirement contributions is likely to be correlated with unobservable firm characteristics that may also be correlated with how attractive the firm is to job-seeking workers. Taking into account firm heterogeneity formally is left for future work.

Canada allows us to observe many such job transitions over 20 years.[9] Sorkin (2018) also relies on employer-to-employer transitions in U.S. administrative data to estimate compensating differentials due to various amenities and finds that firms with higher valuations offer greater pension.

The first-difference (FD) coefficient in the first column ("Overall") of Table 3 suggests that workers are willing to forego 6.3% of earnings to obtain a job with a pension. Given the average earnings, this implies an implicit monetary value of around $3,000. This estimate is broadly consistent with compensating differential frameworks (Olson, 2002, Brown, 1980) and recent findings that highlight the role of benefits in shaping worker preferences and sorting (Barth et al., 2016).

Figure 8 shows the evolution of pension valuation over time for private-sector workers. In 2001–2002, the valuation of pensions was 3.3%. By 2019–2020, however, the valuation in the private sector had increased to 10.1%. This trend suggests a growing demand for retirement security among private-sector workers that may reflect several underlying forces. First, as DB plans become less common, workers may increasingly view pension coverage as a scarce and desirable feature, raising its implicit value. Second, rising concerns over personal financial risk or increased awareness of retirement insecurity—driven by stagnant financial returns and policy uncertainty—may have elevated the perceived importance of employer-sponsored pensions. Third, changes in worker composition or mobility patterns may also play a role, particularly if workers who highly value pension coverage are increasingly likely to switch into jobs offering such plans.

These findings contribute to a growing literature on non-wage job attributes and their valuation by workers. While much of this work has focused on health insurance or flexibility (e.g., Maestas et al., 2023, Mas and Pallais, 2017), our results emphasize the persistent and growing role of retirement benefits in shaping job choices. The upward trend in valuation also suggests that declining pension coverage may generate welfare losses for certain segments of the workforce, raising questions about whether private savings mechanisms can fully substitute for employer-based coverage.

Note that we do not observe other amenities offered by the firm. Humlum et al. (2025) shows for example that pension contributions as well as family friendliness, social impact, interesting tasks, respect, support for colleagues and managers and work environment are all positively associated with firm amenity values, and that many amenities that appear to be significantly associated with wages in univariate regressions

[9]Using the same data, Dostie et al. (2023) investigates job mobility patterns and find no evidence for violations of the exogenous mobility assumption.

lose significance in multivariate settings. To attribute our FD estimate to the impact of pension, we have to effectively assume that other amenities offered by the firms are comparable on average.

4.1. **Heterogeneity in workers' relative valuation of the main types of pension plans.** We next turn to the relative valuation of DB versus DC pension plans. In the case of DC schemes, many studies look at the trade-off between earnings and pension plan valuation, suggesting that this trade-off is approximately one-for-one (Bozio et al., 2020). This result is unsurprising to economists, as employers are likely to be indifferent between providing an additional $1 of compensation through wages or into a pension account (Breunig and Sobeck, 2020, Coates et al., 2020, Bozio et al., 2020).

However, for DB plans the trade-off between earnings and pension benefits is more complicated for three important reasons. First, in DB plans there is a much weaker link between contributions and expected future benefits due to pooling. A DB pension plan may result in some workers giving up $1 of earnings today but receiving much less (or nothing at all) in the way of additional pension benefits (e.g., individuals who leave the firm before vesting, or who have reached the maximum contribution years for their firms' plan). On the other hand, older individuals with a long tenure at the firm may expect to get back much more in retirement than they are giving up today (due to back-loaded accruals). Thus, we may expect heterogeneity in the pass-through effects of pension contributions to wages based on worker characteristics.

The second important consideration is the relative value of DB plans to workers. On the one hand, DB plans provide a form of insurance, reducing workers' exposure to longevity risk or poor returns. On the other hand, empirical evidence suggests that employees may not place a high value on DB pensions. For example, evidence from the U.S. suggests that public school employees in Illinois are willing to pay just 20 cents on average for a $1 increase in the present value of expected retirement benefits (Fitzpatrick, 2015).[10] If employees truly place such little value on DB benefits, then employers will bear more of the economic incidence of pension contributions and there will be less passthrough to wages.

Third, DB plans create additional risk and regulatory burden for employers, which may shift their labor demand curve inwards and reduce their wage offers to current and prospective employees.

[10]In a related finding, Goda et al. (2017) show that employees who are defaulted into a DC plan are less likely to switch jobs, despite potential job-lock effects of DB plans, which indicates that individuals preferred DC plans for reasons other than portability.

While we do not observe pension valuation directly, our estimate of the relative values of DB versus DC pension plans rely on labour market movements of workers between different types of pension plans. Relying on observed earnings changes when individuals move between jobs with and without pension coverage is also more appropriate when focusing on the private sector. Pooling workers from the private and public sector may bias the relative valuation of DB and DC pension plans, given that Defined Benefit (DB) plans remain dominant in the public sector. According to Statistics Canada (2024), roughly 80% of public-sector workers are covered by a DB plan—a share that has remained stable for the past two decades. In contrast, the shift toward Defined Contribution (DC) plans has been concentrated in the private sector.

As a result, observed transitions between DB and DC coverage may disproportionately reflect mobility between the public and private sectors. Since these job moves often involve changes in wages, job security, and non-wage amenities beyond pension coverage, they introduce confounding variation that may bias our valuation estimates. For instance, public sector jobs are generally associated with more stable employment, predictable schedules, and different promotion structures. The longitudinal administrative tax data we use for this project contains detailed information on employment income, allowing us to examine those trade-offs in innovative ways.

Column 2 ("Aggregate") of Table 3 further decomposes the FD estimates by plan type. The implicit valuation is 7.4% of earnings for DB plans, compared to 5.2% for DC plans and 6.2% for other plan types. Those heterogeneous valuations may reflect differences in risk preferences or information: DB plans, though less common in the private sector, may be viewed as more attractive due to their income guarantees and longevity protection. Alternatively, the rarity of private-sector DB coverage may signal quality employers, leading to a premium that reflects both pension generosity and broader job characteristics.[11]

Figure 9 mirrors the findings of Figure 8 and shows that increasing valuation over time is observed for both DC and DB pensions plans, with larger increases for the increasingly scarce DB plans.

Finally, column 3 ("Detailed") of Table 3 provides a more granular decomposition of pension valuation among private-sector workers by plan subtype, using the classification detailed in Appendix A and summarized in Table 2. The results reveal substantial heterogeneity in how different pension structures are valued in earnings terms.

[11]Clark and Pitts (1999) find that, at least in the academic market, workers strongly prefer defined-contribution plans because it helps them avoid the mobility risk associated with the loss of pension benefits that is embedded in defined-benefits plans.

Among Defined Benefit (DB) plans, only *Flat Benefit* schemes appear to be valued more highly than the benchmark *Money Purchase* DC plans. Specifically, workers with *Flat Benefit* coverage are estimated to accept a wage trade-off equivalent to more than 12% of earnings—substantially above the valuation for any other plan type. This premium may reflect the plan's relative simplicity and predictability. Unlike DB plans based on tenure-weighted or earnings-formula calculations, *Flat Benefit* plans offer a straightforward, fixed-dollar payout per year of service, which may make them easier for workers to understand and value. Their reduced ambiguity could be particularly attractive to risk-averse or financially unsophisticated workers.

By contrast, other DB plan types—such as *Average Best Earnings (best years)* or *Final Average Earnings*—are valued less than *Money Purchase* DC plans. These plans often involve benefit formulas that depend on a subset of highest-earning years, which introduces uncertainty and complexity. However, one exception is *Career Average Earnings* plans, which show a somewhat higher valuation than other non-flat DB designs. This may be due to their smoother accrual profiles and reduced sensitivity to job timing or promotion trajectories, which could make expected benefits more predictable. This aligns with findings from Bodie et al. (1988), who reports that workers in *Career Average Earnings* plans exhibit lower perceived volatility and place a higher premium on them compared to final-average schemes.

Among hybrid or "other" pension types, *Defined Benefit / Defined Contribution (DB/DC)* combination plans are valued slightly more than standard DC plans. This pattern likely reflects the perceived value of retaining DB-like features, such as income guarantees or longevity protection, while maintaining the transparency and portability of DC structures. These hybrid designs may appeal to workers seeking both security and flexibility, particularly in environments where full DB coverage has become rare.

Taken together, these results underscore the importance of pension plan design in shaping worker preferences. Valuation appears to depend not only on the formal DB vs. DC distinction, but also on how benefits are structured and communicated. Plans that offer more transparent, predictable, or easily understood accrual rules tend to be valued more highly—suggesting that informational salience and perceived reliability are central to how workers assess retirement benefits.

5. Mobility

Understanding how pension plans affect worker flows into and out of firms is important for policy makers. In terms of outflows, one long-running concern about DB pensions is that they may create a "job lock" effect (e.g., Mitchell, 1982, Lazear, 1990)leading to less efficient labor markets and lower wage growth. The theoretical argument for a negative impact of DB pensions on job mobility is that DB pension formulas typically provide a disproportionately large pension for workers with long tenures.

These flows are mostly due to three phenomena. First, pensions could effectively lock workers to their current firms in fear of losing their pension benefits if they move (Gustman and Steinmeier, 1993). Second, in addition to a potential job-lock effect, employer-pensions are likely to affect older workers' decisions to leave the firm for retirement (Staubli and Zweimüller, 2013). Third, another important and related aspect of worker flows is the selection component: that is, how do pension plans attract different types of workers to the firm in the first place (Goda et al., 2017)? We briefly discuss those three issues.

Job lock effects: In Canada, one of the most common DB plan is the *final-earnings plan* (Luchak et al., 2004), which bases the annual pension benefit on a given percentage of the worker's final earnings in the job multiplied by the years of pensionable service. With this type of plan, pension accruals will be much larger later in a worker's career, due to rising real and nominal wages over the life-cycle, and these 'back-loaded' accruals provide a disincentive to change jobs.

Existing evidence on the job-lock effect of pensions has relied on data with significant limitations, such as data on specific companies or from self-reported surveys (Lazear, 1982, Gustman and Steinmeier, 1993, Andrietti and Hildebrand, 2016). Our data allows us to track the entire population of workers over time and study how their mobility is affected by the size of their potential pension losses if they switch jobs. This loss will vary over time, by plan and across individuals within plans (e.g., depending on whether the individual is vested, as well as their age, tenure and expected earnings growth). We can use this variation to estimate the job-lock effect in Canada for different types of employer-pensions.

Retirement: In addition to a potential job-lock effect, employer-pensions are likely to affect older workers' decisions to leave the firm for retirement. A large literature in economics shows that older workers' retirement decisions are sensitive to the incentives in retirement schemes, but most of this literature has focused on public pensions (e.g., Krueger and Pischke, 1992, Staubli and Zweimüller, 2013). Due to data limitations,

there has been relatively little work examining the importance of private pensions on retirement decisions. In the context of Canada, employer-pensions can usually only be claimed if a worker terminates the relationship with their employer.

Moreover, pension formulas often provide a strong disincentive to keep working beyond some minimum access age, since the present value of the pension benefits often declines with the retirement age. There is likely to be considerable variation in these incentives across plans and based on worker characteristics (e.g., age, tenure and earnings trajectory). The impact of pension plans on retirement patterns is left for future research.

Selection: Another important and related aspect of worker flows is the selection component: that is, how do pension plans attract different types of workers to the firm in the first place? A mature literature suggests that firms may offer pensions in part to attract "stayers" rather than "leavers" (e.g., see Gustman et al., 1994, for an early review of this literature). Research on workers in the US Navy and US Airforce shows that these pensions may also attract "savers" rather than "spenders" (Ippolito, 2002). This intuitive result is concerning as it suggests that employer-pensions may provide little support for individuals who are least prepared for retirement.

Despite the importance of understanding the role of employer-pensions in attracting different workers to firms, causal evidence on this question is limited. A recent study provides an exception (Goda et al., 2017), but the context of their study — a single university undergoing a change to their pension plan — is extremely specific. By contrast, our data covers the universe of tax payers in Canada. In terms of employee attraction, Cole and Taska (2023) find that dollars paid in employer contributions to 401(k) plans have nearly double the effect on a firm's recruiting success than dollars paid in wages.

As a simple way to start assessing the impact of pension plans on mobility, the impact of pensions on mobility is estimated with a quit probability model (e.g., Carranza and Goodman, 2024, Goda et al., 2017, Gustman and Steinmeier, 1993, Mitchell, 1982). Let y_{ijt} be an indicator variable equal to 1 if worker i is no longer employed by firm j at time $t+1$ and 0 otherwise. We can then estimate a linear quit probability model in which

$$P(y_{ijt} = 1) = \alpha X_{it} + \beta Z_{jt} + \tau pension_{ijt} + \theta_i + \varepsilon_{ijt}$$

with X_{it} incorporating time-varying worker-level characteristics (like age), Z_{jt} time-varying firm-level covariates (like changes in sales). θ_i is a time-invariant worker-specific effects, allowing us to exploit the longitudinal structure of the data to control

for worker unobserved heterogeneity in mobility patterns.[12] ε_{ijt} is the error term. The variable $pension_{ijt}$ is a vector of dichotomous variable indicating the presence of various pensions plans (for the types of pension plans described in Appendix A). The coefficient of interest is τ that represents the impact of pension type for worker i in firm j on the probability of quitting. If pensions reduce mobility, it is expected to be negative.

Table 4 presents estimates of the relationship between pension coverage and worker mobility. For comparison, columns (1) and (2) also report estimates from pooled OLS and worker fixed effects (FE) specifications, respectively. Given that the average year-to-year retention rate in the private sector is around 90%, the absolute decline implied by our estimates are substantial.[13] Across all specifications, the presence of a pension plan is associated with a significant reduction in worker mobility. That is, workers with pension coverage are less likely to switch employers from one year to the next than their counterparts without such coverage.

The magnitude of the decline varies considerably by plan type. In general, workers with DB coverage are substantially less mobile than those with DC or hybrid plans. For instance, individuals covered by an *Average Best Earnings (total tenure)* DB plan experience a mobility decline of roughly 70% relative to similar workers without pension coverage. In contrast, workers with a DC plan exhibit a smaller, though still meaningful, reduction in mobility—approximately 35%. Hybrid plans such as *Defined Benefit/Defined Contribution* show effects similar in magnitude to those of DC plans, consistent with the structural proximity between the two.

One notable exception is the case of *Flat Benefit* DB plans, which do not lead to as large a decline in mobility as other DB types. This may reflect their simpler, more transparent accrual structure, which could reduce the "lock-in" effect commonly associated with back-loaded pension benefits. In contrast, plans like *Final Average Earnings (Best Years)* DB schemes concentrate accrual toward the end of tenure, generating strong incentives for workers to remain with the same employer.

These findings align with prior research highlighting the role of pensions—especially DB plans—in increasing job tenure and reducing voluntary turnover. For instance, Stock and Wise (1990) and Hutchens (1999) show that DB pension wealth accrual patterns create sharp discontinuities in quitting behaviour. Our results confirm that

[12]Controlling for worker unobserved heterogeneity is important since Goda et al. (2017) find that employees with higher mobility tend to self-select into DC plans.

[13]This compares with a one-year retention rate of 80.5% in the U.S. Survey of Income and Program Participation between 1984 and 1985 used by (Gustman and Steinmeier, 1993) and 93.3% for a sample of nonfaculty employees in a large research university in 2002 used by Goda et al. (2017).

such effects persist in the modern private-sector context and extend them by showing substantial variation across plan types.

In Canada using survey data (the Workplace and Employee Survey 1999-2004), Fang and Messacar (2019) find that having a pension decreases the quit rate by 1.5 percentage points compared to a baseline mobility rate of 8.5 percent, but the authors don't have information on the exact pension type. The one-year quit rate in our data is slightly higher (10 percent), and we show that the mobility impact is considerably higher on average and varies greatly based on the characteristics of the pension plan.

However, our findings are also to be contrasted with those of Gustman and Steinmeier (1993) who found that DC and DB contribution plans bear similar negative relationships with mobility. This might be true on average in our results, but we show considerable heterogeneity within broadly defined categories.

Our estimate of the impact of DC plan on 1-year mobility is comparable to those found by Goda et al. (2017). However, in her specific setting (nonfaculty employees from a large university), she finds much bigger mobility effects when comparing DC and DB plans, or a 5.5 percentage point difference, which suggest to them that DC plans have other attributes that make them more attractive, such as individual control, liquidity and transparency.

Our result of a stronger overall mobility-reducing effects of DB plans could indicate that they remain an effective tool for firms seeking to retain experienced workers. However, these effects may come at the cost of lower allocative efficiency in the labor market, especially if workers are induced to stay in suboptimal matches due to pension-related lock-in effects.

6. Conclusion

This paper leverages a novel linkage between the Pension Plans in Canada (PPIC) census and longitudinal administrative employer-employee data to document pension coverage patterns, estimate the implicit value workers place on employer-sponsored pensions, and assess the impact of pension plans on labor market mobility in Canada.

With respect to pension coverage, we find that official statistics overstate the number of unique individuals with pension coverage in the private sector, probably due to double-counting of workers with multiple pension affiliations over the course of a year.

Turning to valuation, we find that workers are willing to accept, on average, a 6% reduction in earnings to obtain a job with pension coverage. This willingness-to-pay

has increased steadily over the past 20 years, particularly among private-sector workers. Disaggregated estimates show meaningful heterogeneity across plan types: Defined Benefit (DB) plans tend to be valued more highly than Defined Contribution (DC) plans, particularly in the private sector. Within DB plans, simpler and more predictable accrual structures—such as *Flat Benefit* formulas—command the highest valuations, suggesting that salience, transparency, and perceived security play important roles in worker preferences.

Pension plans also exert a significant effect on job mobility. Across specifications, workers with DB plans are substantially less mobile than those without coverage or with DC plans. Fixed worker-effects estimates imply that mobility declines by roughly 40% for DB-covered workers, consistent with the presence of strong retention incentives embedded in traditional DB plan structures. While such patterns may benefit firms seeking to retain experienced workers, they may also contribute to reduced allocative efficiency if pension-related "job lock" discourages beneficial mobility.

This research contributes new evidence on how plan design shapes worker behavior in a setting where public and private pension institutions differ markedly. Future work will exploit additional data available in PPIC on employer and employee contribution rates, plan funding levels, and regulatory status. Further integration of firm-level outcomes—such as profitability, productivity, and workforce composition—will allow for a more complete analysis of how pension offerings interact with firm behavior and performance, and whether the incidence of pension contributions ultimately falls on employers, employees, or both.

Finally, we will look at heterogeneous effects by worker characteristics. For example, understanding how the effects on earnings may vary by age is crucially important, as wage-gaps between older and younger workers are rising in many countries (Bianchi and Paradisi, 2024). This will provide insight into the role of pensions in determining the steepness of age-wage profiles, which is closely related to influential theoretical work by Lazear (1979, 1982), as well as their impacts on retirement decisions (Friedberg and Webb, 2005).

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Appendix A. Pension Plans in Canada: types of plan

Final Average Earnings: The unit of pension for each year of service is a fixed percentage of the employee's average earnings during a specified period immediately preceding retirement.

Average Best Earnings (total tenure): The unit of pension for each year of service is a fixed percentage of the employee's highest earnings over the employee's total tenure.

Average Best Earnings (best years): However, if the unit of pension was a percentage of the average earnings of his highest years of earnings in a fixed period just before retirement

Career Average Earnings: Each year the employee earns a unit of pension equal to a percentage of his earnings in that year. The benefit formula may be expressed as a fixed percentage of average earnings, for each year of service, over the entire period of the member's participation in the plan, or expressed as a percentage of the employee's total contributions.

Flat Benefit: Under a flat benefit plan, the pension benefit is usually expressed as a fixed dollar amount (independent of earnings) for each year of service.

Money Purchase: A money purchase plan defines the employer (as well as employee, if contributory) contribution rate, generally expressed as a percentage of the employee's earnings. The contributions, together with interest, accumulate to provide whatever pension benefits can be purchased at the time of retirement.

Profit Sharing: A profit sharing pension plan is essentially a money purchase plan except that employer contributions are related to profits. While the employer contributions are not fixed by formula, a minimum annual contribution of one percent of the remuneration of participating employees is required whether or not a profit was earned.

Hybrid: In a hybrid plan, the pension is the better of that provided by defined benefit or defined contribution provisions. For example, the better of a defined benefit, of, say 1.5% of salary for each year of service, and the pension that can be generated by defined contributions of say 5% from the member matched by the employer.

Composite/Combination: In composite/combination plans, the pension has both defined benefit and defined contribution characteristics. The most common is a combination of "money purchase" (for employee contributions) and “defined benefit" (paid for by the employer).

Defined benefit/defined contribution: Defined benefit/defined contribution plans are a type of plan where some employees will receive a defined benefit and others receive a defined contribution benefit. These plans may be for different classes of employees or one benefit type may be for current employees and the other for new employees.

Source: Pension Plans in Canada. Uniform Statistical Program Reporting Instructions. Pensions Section. Statistics Canada. Revised July 2015.

Appendix B. Figures

Figure 1. Number of registered pension plans

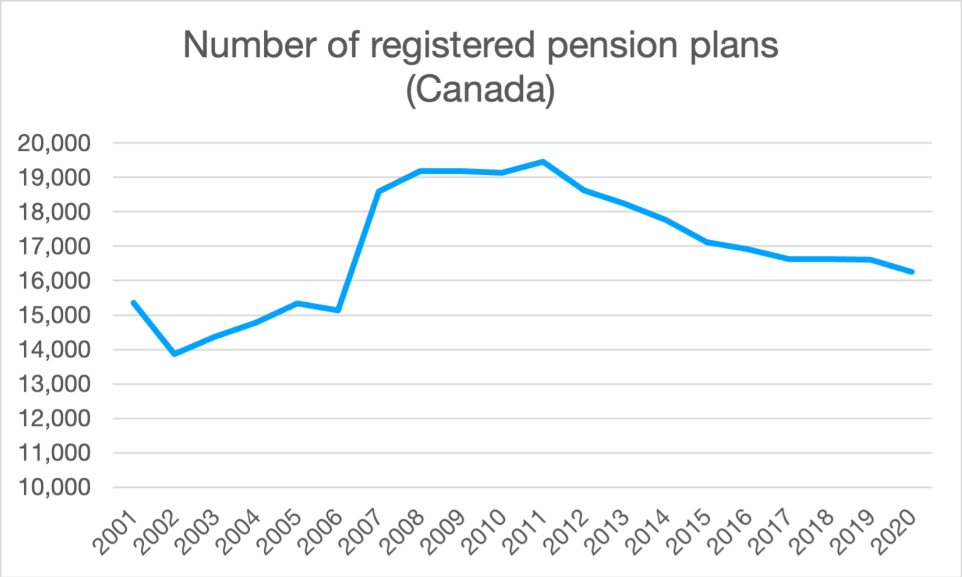


Figure 2. Total number of members

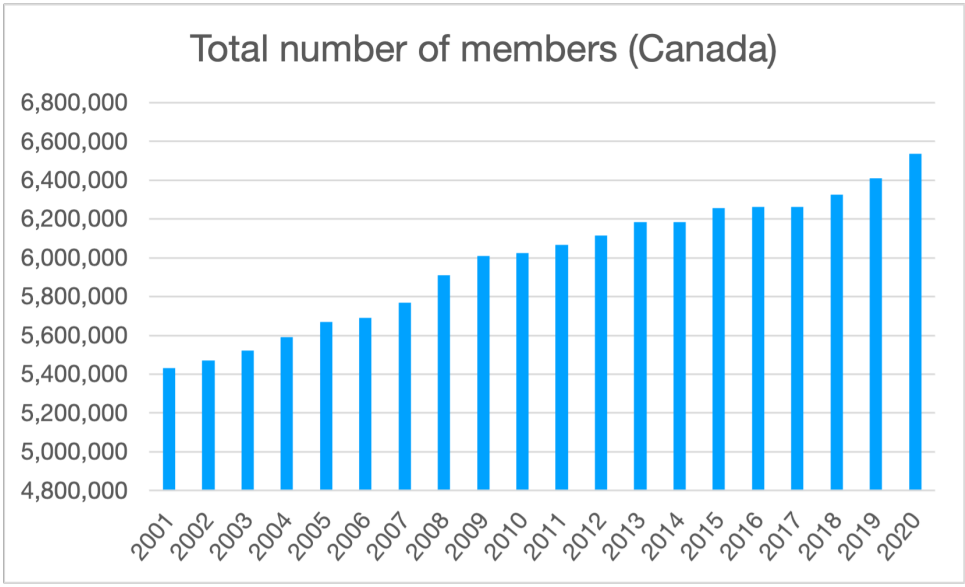


FIGURE 3. Size of plans

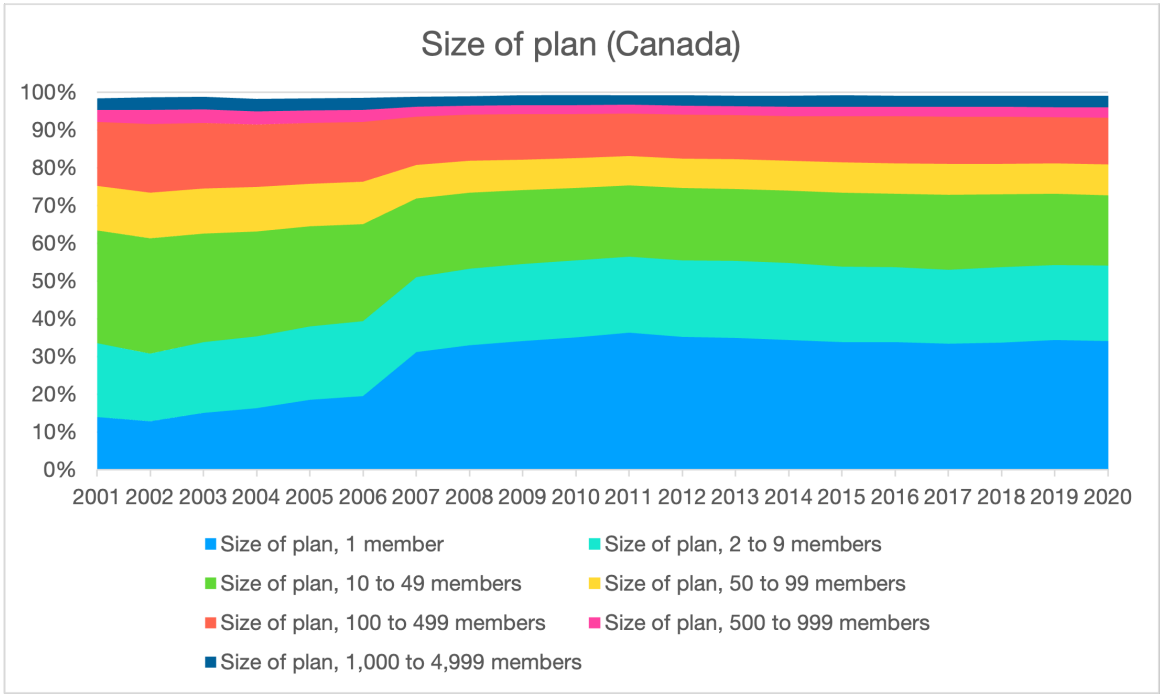
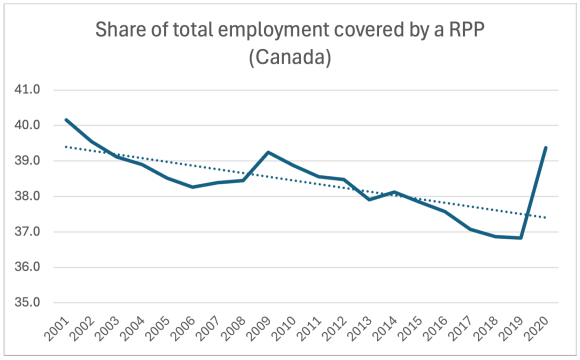
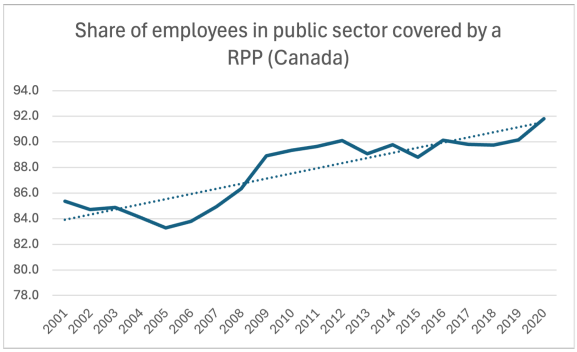


FIGURE 4. Share of employment covered by a RPP based on PPIC data

(A) Total employment



(B) Public sector



(C) Private sector

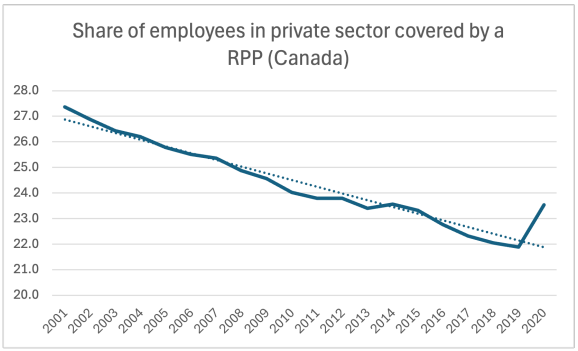


FIGURE 5. Share of employees in private sector covered by a RPP based on merged PPIC–CEEDD data

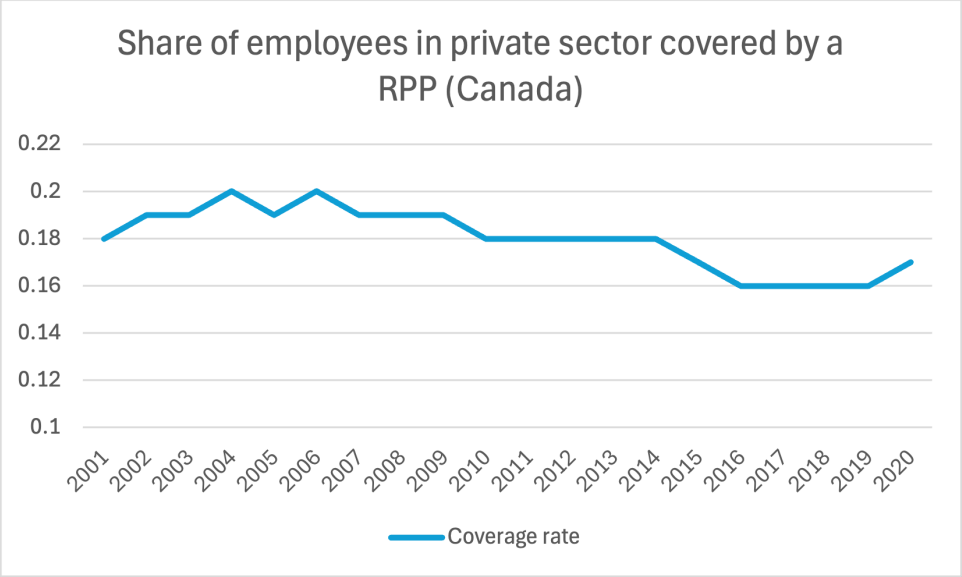


FIGURE 6. Comparisons of the share of employees in private sector covered by a RPP under different scenarios

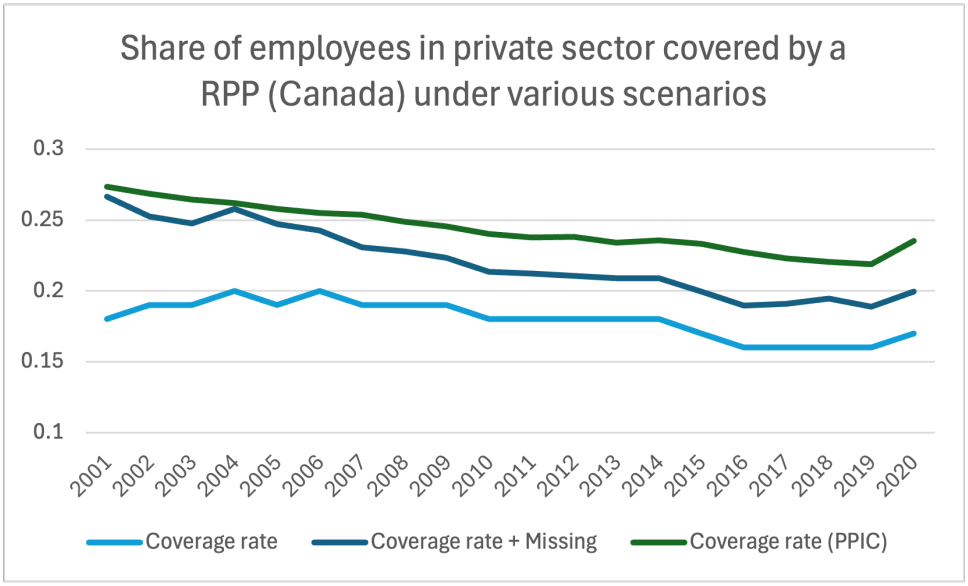


FIGURE 7. Among private sector employees covered by a RPP, share covered by each type of pension plan (CEEDD)

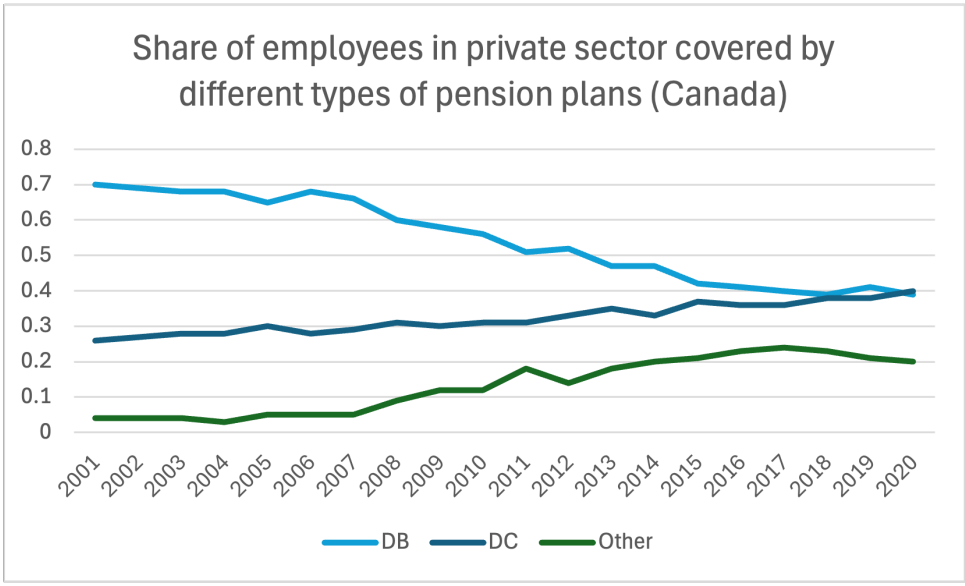


FIGURE 8. First-differences estimates of the value of pension over time (private sector)

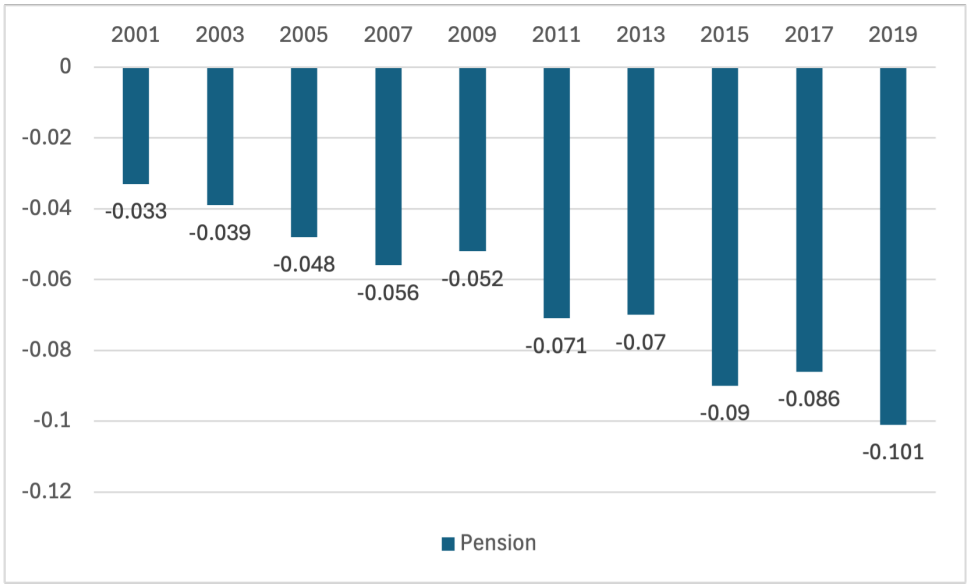
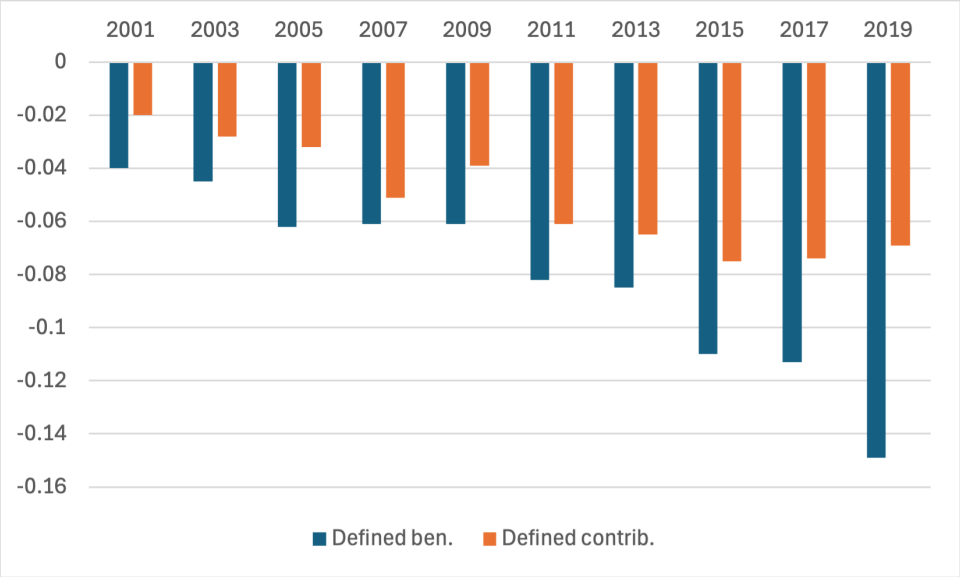


FIGURE 9. First-differences estimates of the value of pension over time DB versus DC (private sector)



Appendix C. Tables

Table 1. Matching rates between PPIC and T4

Year	Matching rate (%)
2001	89.8
2002	92.8
2003	93.4
2004	93.4
2005	93.5
2006	95.2
2007	95.4
2008	95.8
2009	96.3
2010	96.3
2011	96.4
2012	96.6
2013	96.8
2014	96.8
2015	96.7
2016	96.7
2017	96.6
2018	96.2
2019	96.8
2020	96.7

TABLE 2. Types of pension plans

Pension plan	Type
Final Average Earnings	DB
Average Best Earnings (total tenure)	DB
Average Best Earnings (best years)	DB
Career Average Earnings	DB
Flat Benefit	DB
Money Purchase	DC
Profit Sharing	DC
Hybrid	Other
Composite/Combination	Other
Defined benefit / defined contribution	Other
Other	Other

TABLE 3. FD regression results: Overall, aggregate, and detailed pension types (private sector)

	Overall	**Aggregate**	**Detailed**
Any pension plan	−0.063***		
	(0.000)		
Defined Benefit (DB)		−0.074***	
		(0.000)	
Final average earnings			−0.020***
			(0.001)
Average best earnings (total tenure)			−0.025***
			(0.001)
Average best earnings (best years)			−0.034***
			(0.001)
Career average earnings			−0.040***
			(0.001)
Flat benefit			−0.122***
			(0.000)
Defined Contribution (DC)		−0.052***	
		(0.000)	
Money purchase			−0.052***
			(0.000)
Other Plans		−0.062***	
		(0.000)	
Hybrid			−0.022***
			(0.001)
DB/DC combination			−0.061***
			(0.001)
Other			−0.044***
			(0.001)
R-squared	0.009	0.009	0.009
N	77,420,535	77,420,535	77,420,535

Note: FD = First-difference regression estimates. Source: CEEDD 2001–2020. All regressions include controls for gender, age (quadratic), marital status, province, and year. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

TABLE 4. The impact of different types of pension on 1-year mobility (private sector)

	OLS	FE
DB		
Final average earnings	-0.062***	-0.052***
	(0.001)	(0.001)
Average Best Earnings (total tenure)	-0.064***	-0.068***
	(0.000)	(0.000)
Average Best Earnings (best years)	-0.057***	-0.052***
	(0.000)	(0.001)
Career Average Earnings	-0.040***	-0.034***
	(0.000)	(0.001)
Flat Benefit	0.024***	-0.014***
	(0.000)	(0.000)
DC		
Money Purchase	-0.040***	-0.036***
	(0.000)	(0.000)
Other		
Hybrid	-0.044***	-0.026***
	(0.000)	(0.000)
Defined benefit/Defined contribution	-0.043***	-0.036***
	(0.000)	(0.000)
Other	-0.041***	-0.045***
	(0.001)	(0.001)
R-squared	0.027	0.007
N	77,417,025	77,417,025

Note. Source: CEEDD 2001-2020. All regressions include controls for gender, age (quadratic), marital status, province and year. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.