March 20, 2025

Dear Susanto, Dave, and Karen,

Please find attached a paper submission, "Do State and Local Governments Offer Competitive Compensation?" for the SI 2025 CRIW conference. The paper compares the measurement of state and local wages relative to private using the ECI—the standard benchmark in most research—and an augmented ECI that we construct to better account for compensation differences. Specifically, our measure corrects the treatment of pensions (which the ECI measures by the employer's cash contributions instead of the accrual value to the employee) and adds a measure of the value of retiree health benefits and job stability, both of which the ECI omits. We show that, once these elements are included, state and local compensation has declined sharply relative to the private sector over the past decade.

The current draft of the paper is very preliminary. In particular, the paper is rough and incomplete in places—particularly towards the end—and we have more work to do on developing some of the methodology. Moreover, the paper's conclusions are tentative at this stage. All this said, we hope the draft succeeds in conveying what we intend to deliver by the time of the conference. In addition to the content in the draft, we intend to explore adding content on:

- The sensitivity of our findings to variations in the discount rate used to value pension and retiree health liabilities.
- An alternative approach to valuing retiree health care using the option value of work framework developed in Stock and Wise (Econometrica, 1990).
- Trends in the generosity in retiree health insurance.
- Public-private compensation differential by employee groupings such as educational attainment and age (currently covered very briefly in section IV.D of the paper).
- Geographic or state-specific differences in compensation differentials.
- The effect of the downward trend in relative compensation we document on the quality of the state and local government workforce.
- The value of student loan forgiveness as a result of public service as an additional compensation component.

While we may not incorporate all of these elements, we expect to integrate several of them into the final version.

Thank you for considering the paper.

Best,

Byron, David, and Louise

Do State and Local Governments Offer Competitive Compensation?

Byron Lutz
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February 21, 2025

* We thank Ruth Schlosser for outstanding research assistance. We thank the Bureau of Labor Statistics for generously providing unpublished Employment Cost Index tabulations. The analysis and conclusions reached in the paper are the authors' alone and do not indicate concurrence by the Board of Governors of the Federal Reserve.

Abstract

We examine the relative compensation of state and local government workers compared to their private sector counterparts. Augmenting standard data sources on worker compensation with information on worker benefit provision derived from unpublished Bureau of Labor Statistics data and asset-based methodologies for valuing non-wage benefits, we document a significant erosion in the public sector compensation premium over the past fifteen years. While state and local workers received approximately 15 percent higher total compensation than comparable private sector workers in 2010, our evidence indicates this differential had been eliminated by 2024. This convergence stems from multiple factors: public sector wages have fallen steeply relative to private sector wages since the Great Recession, public sector retiree health care benefits have diminished, and the historically greater job stability in government employment has eroded. We also document that the use of cash accounting for defined benefit pensions, as opposed to accrual accounting, significantly skews upward the trend in relative public sector compensation in the Employment Cost Index—a principal source of information on compensation trends in the U.S. These findings have significant implications for public sector recruitment, retention capabilities, and ultimately, for the administrative capacity of state and local governments to effectively implement policies and deliver essential services.

I. Introduction

State capacity—the government's ability to effectively implement policies and achieve its objectives—has become a focal point in recent policy discussions, especially in light of challenges that arose in the aftermath of the COVID-19 crisis as well as those surrounding the implementation of the Inflation Reduction Act (IRA). Enacted in 2022, the IRA aimed to allocate substantial funds toward clean energy and climate initiatives. However, its rollout has encountered significant delays due to administrative hurdles and regulatory uncertainties, underscoring the critical role of state capacity in translating legislative intent into tangible outcomes. At the subnational level, the water crisis in Flint Michigan is at least partially explained by a lack of adequate technical expertise and oversight capacity at the state level (Flint Water Advisory Task Force 2016); more mundane, but not inconsequential, the Hawaii Department of Taxation struggled to modernize tax administration due to staff with inadequate project management expertise (Wood 2016). Competitive state and local government worker compensation is thus essential in the context of subnational state capacity in the U.S. as it directly influences the recruitment and retention of skilled personnel necessary for effective governance and policy execution. On the other hand, state and local employees may be overpaid relative to their private sector counterparts (e.g. Biggs 2012). If so, public-sector efficiency gains could be achieved by bringing public sector pay into better alignment with private sector compensation.

Comparisons between state and local government workers and private sector workers are complicated by the very different profile of employees across the sectors; e.g. public sector workers have higher average educational attainment. Moreover, public employees receive a higher share of their compensation in the form of benefits than do their private sector counterparts. Measuring the value of public sector benefits such as defined benefit pensions and retiree health care is methodologically complex and the standard data sources on worker compensation in the U.S., such as the Current Population Survey (CPS) and Employment Compensation Index (ECI), either fail to measure these benefits at all or suffer from notable measurement deficiencies.

In this very preliminary paper, we measure the total compensation of state and local government (or "public") workers relative to the private sector. In doing so, we make a number of contributions. First, following a surge of work on the topic of relative state and local government pay around 2010, there has been little to no research on this topic in recent years to the best of our knowledge. We bring the research up to date, accounting for the evolution in the public and private labor markets over roughly the last 15 years. Second, we make methodological contributions surrounding the proper measurement of benefit compensation. In particular, we utilize accrual-based measurement to value the defined benefit (DB) pension and retiree health care benefits earned in a given year. We also quantify the relative difference in job stability across the public and private sectors and develop an asset-based valuation approach for this job attribute. We then combine these benefit valuation measures with CPS and ECI data, including unpublished tabulations of the ECI provided to us by the Bureau of Labor Statistics (BLS), to construct a measure of the total public sector wage premia, and also its trend over time. Third, we break down the public sector premia measures both by age and education. Finally, we provide evidence on the change in the quality of the state and local workforce over time in order

to assess if changes in relative public sector compensation have implications for the quality of public goods provision.

Our preliminary evidence speaks most clearly to the trend over time in the public sector relative compensation differential. We find that since the Great Recession, wages of public sector employees have fallen substantially relative to the private sector. Moreover, the value of retiree health care in the public sector has declined and relative job stability in the public sector has eroded relative to the private sector. Thus, the total relative compensation of state and local government workers relative to private employees has unambiguously eroded, and eroded steeply, over the past 15 years.

This conclusion stands in stark contrast to that provided by the Employment Cost Index which suggests that relative compensation has been roughly flat over the past 15 years. We document the difference in the ECI relative to our conclusion stems from two sources. First, the ECI accounts for DB pension benefits on a cash basis. Our switch to accrual accounting for DB pensions, in isolation from any other adjustments, induces a downward trend in total relative public sector compensation. The difference in accounting approaches is material because state and local governments have been sharply ramping up their contributions to pension plans in recent years in order to address the past underfunding of these benefits. In doing so, they push up benefit compensation measured on a cash basis. At the same time, these governments have been paring back on the actual level of pension benefits provided to employees, pushing down on benefits properly measured on an accrual basis. Thus, the two accounting approaches yield very different trends in state and local government benefits. The second factor driving a wedge between our conclusion and the ECI is the ECI's failure to account for retiree health care and job stability.

Our evidence on the level of the public sector compensation differential—as opposed to its trend—is less clear cut as it is highly dependent on a number of methodological assumptions. That said, our preliminary evidence suggests that public sector workers were paid about 15 percent more than their private sector counterparts as of 2010. Since then, though, this public pay premium has gradually eroded to zero as of 2024; i.e. state and local workers appear to be currently paid about commensurately with their private sector peers when all job benefits and attributes are accounted for.

Finally, we find evidence that the trend decline in relative public sector compensation is more pronounced for college-educated employees. Future drafts will further develop the evidence on relative public sector compensation by education and age and also provide evidence on changes in the quality of the state and local government workforce over time.

The paper proceeds are follows. Section II provides background information, including information on public and private sector workers and compensation packages in the two sectors, as well as reviewing past work on public-private pay differentials. Section III discusses the data we utilize, including the important limitations of the primary U.S. data sources on employee compensation. Section IV presents our methodology and results. Section V concludes.

II. Background

II.A Employee Characteristics and Compensation in the State and Local Government and Private Sectors

Employee characteristics differ starkly across the state and local and private sectors. As displayed in Table 1, public workers are more likely to be married and female than private workers, although the racial makeup is broadly similar across the sectors. The starkest differences are in educational attainment and occupation: state and local workers are 22 percentage points more likely than private employees to have a four-year college degree or more (rows 9) and are 22 percentage points more likely to be in a professional or managerial occupation (row 10). These difference in characteristics must be accounted for when assessing relative compensation across the sectors.

Table 1
Summary Statistics

row		Private	State and Local Government
	A. Employee Demographics		
1	Age	40.6	44.1
2	Married	0.51	0.60
3	Female	0.47	0.61
4	White	0.60	0.65
5	Black	0.11	0.13
6	Hispanic	0.20	0.15
7	High School	0.26	0.14
8	Some College	0.26	0.22
9	4-year College or More	0.40	0.62
10	Managers and Professionals	0.37	0.59
11	Precision Production, Craft and Repair	0.09	0.03
12	Operators, Fabricators and Laborers	0.13	0.04
	B. Share of Total Employee Compensation		
13	Wages	0.84	0.68
14	Benefits	0.16	0.32
15	Defined Benefit Pension (accrual basis)	0.01	0.12
16	Retiree Health Care (accural basis)	N.A.	0.03
17	Other Benefits	0.15	0.17

Source. Panel A: 2024 Current Population Survey; Panel B: 2019 National Income and Product Accounts and author's calculations for retiree health care.
Note. Panel A displays means.

Employees in the two sectors also receive their compensation in different forms. Public workers receive around one-third of their total compensation in the form of benefits, whereas private sector workers receive only around one-sixth (row 14). This difference is mostly explained by defined benefit pension plans which account for over 10 percent of public sector compensation, but account for only a very small share of compensation in the private sector (row 15); retiree health care, which is broadly provided in the public sector but is nearly absent in the private sector, also plays a role (row 16). Other benefits—e.g. health insurance—account for a similar

share of compensation across the sectors (row 17). These differences in benefit provision across the sectors must be properly accounted for in assessing relative total compensation.

II.B Past Research

There was a flurry of research on state and local government – private wage differentials around 2010-2012 driven by the difficult budget conditions confronting these governments in the wake of the financial crisis and Great Recession. These papers generally concur that state and local workers receive lower wages, but higher benefits, than their private sector counterparts. They reach widely divergent conclusions, however, over whether the non-wage compensation is sufficient to result in a positive public sector total compensation premium. The different conclusions are generally driven by how benefits are measured.

Gittleman and Pierce (2012) conducted an unusually comprehensive analysis using the ECI, CPS, and confidential microdata from the BLS's National Compensation Survey (NCS) data. They found that state and local government workers received higher total compensation than similar private sector workers, with the differential driven primarily by more generous benefits. That said, there are difficulties inherent to using the NCS to measure benefits; in particular pension benefits suffer from a number of methodological concerns (Biggs and Richwine 2012), retiree health care is generally not captured at all, nor is the value of the greater relative job stability in the public sector. The authors acknowledge these shortcomings and conclude that they are unlikely to overturn their conclusion that state and local workers receive a pay premium. Biggs and Richwine (2014) also find positive public-sector compensation premiums across states, ranging from 10% to over 40%. They emphasize the importance of including the value of job security in relative compensation calculations.

In contrast, Munnell et al. (2011), accounting for the value of pensions, retiree health care, and job stability, find that state and local workers earn approximately the same as they would in the private sector. Their work emphasizes education as the critical factor - workers with bachelor's degrees or higher face wage penalties in government work.

Other notable contributions to this body of work include Allegretto and Keefe (2010), Bender and Heywood (2010), Keefe (2012), Lewis and Galloway (2011), Madland and Bunker (2012), Reilly and Reed (2011), Richwine and Biggs (2012), Sherk (2016), Thompson and Schmitt (2010), and Wenger and Wilkinson (2012). Important earlier work on public sector compensation premiums include Borjas (2002), Edwards (2010), Freeman (1987), Katz and Krueger (1991), Krueger (1988), and Poterba and Rueben (1994) and Smith (1977).

III. Data

This section discusses the data used in the analysis. Included is a discussion of cash versus accrual accounting for DB pensions – a key measurement concern for the analysis.

III.A The ECI and CPS

To focus on changes over time in relative pay, we primarily use the BLS's Employment Cost Index (ECI) – the principal national economic indicator for measuring compensation *changes* over time. Interpreting wage changes over time, especially through business cycles, is challenging due to the influence of changing worker composition on wages and benefits. The ECI's defining feature is its use of a methodology to isolate changes in compensation costs unrelated to changes in workforce composition.[1] The ECI provides indexes for various pieces of total benefit compensation – e.g. health insurance. However, there are no published tabulations for DB pensions. Fortunately, though, the BLS generously made available unpublished tabulations which provide detailed information on defined benefit pensions.[2] Although the ECI is very well suited to examining changes in compensation, it fails to provide information on the *level* of compensation, nor does it allow for controlling for worker characteristics when comparing wages across the public and private sectors. To address these shortcomings, we turn to the CPS.

The CPS microdata contains a rich set of information on worker characteristics which allows us to control for the very different compositions of the private and public workforces. Another advantage of the CPS is its longitudinal structure which we exploit to examine differences across the sectors in job stability. The chief drawback of the CPS, however, is its lack of information on non-wage employee benefits.[3]

In principal, we could obtain information on the *level* of benefit provision from the BLS's Employer Costs for Employee Compensation (ECEC). The ECEC is based on the same underlying survey data as the ECI—both are part of the National Compensation Survey (NCS)—and provides information on the dollar value of wages and benefits, but unlike the ECI, does not control for compositional shifts over time. Unfortunately, though, the NCS suffers from methodological issues which render it challenging to use to measure DB pensions, retiree health care, and the value of job stability.

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[1] The ECI achieves this fixed-composition measure in two steps. First, the ECI uses a fixed-weight approach where compensation changes are measured within detailed cells defined by industry, occupation, and sector (private and state and local government) then aggregated up using fixed employment weights. Second, the ECI methodology uses a matched-sample approach under which the change in compensation from time *t-1* to *t* is calculated only using "matched job quotes". Matched job quotes refer to the average compensation costs per hour within an establishment-occupation (i.e. a "job") which are available for both the time *t* and *t-1*. The use of matched job quotes ensures that measured compensation changes do not reflect composition shifts within the detailed industry-occupation cells. E.g. it prevents the entry of a new establishment into the ECI sample at time *t* from influencing measured compensation growth a time *t*.

[2] The DB pension series should be interpreted with care because they do not meet the BLS's standard publication criteria.

[3] In terms of specifics, the CPS surveys roughly 150,000 individuals each month. Each household is sampled for two four-month periods, with an eight-month gap in between. On the 4th and 8th months in the survey (the outgoing rotations), the CPS collects data on wages. We use the CPS extracts from the Economic Policy Institute (EPI); the EPI Merged Outgoing Rotation Group surveys harmonize data over time on wages and demographic information of workers. We use EPI's wage variable which imputes hourly wages for salaried workers using their reported usual hours worked, and adjusts for workers with variable hours. The EPI wage variable also accounts for top-coding but we exclude overtime, tips, and commissions. Following Gittleman and Pierce (2012), we exclude workers for whom wages or hours data are imputed by the Census (about 43,000 observations in the 2024 ORG Data).

III.B Alternative Data Sources for Benefit Accounting

Job stability, while a valuable job attribute, is not a "benefit" and is therefore not measured in the NCS. Retiree health care is widely provided as a benefit to state and local workers, but is overwhelming not prefunded (Pew 2023). Instead, payments are made annually to cover the insurance costs. As these payments are made on behalf of retirees, not current employees, they are not captured in the NCS. Thus, the NCS mostly misses the value of retiree health care. (Private firms generally do not provide retiree health care as only about 3 percent of private employers offer any form of this benefit (EBRI 2024)).

In terms of DB pensions, the NCS measures the value of this benefit on a cash basis – i.e. by the amount contributed to the pension fund annually. This cash accounting does not reflect the benefits being earned by workers which requires measuring on an accrual basis – i.e. by calculating the present discounted value of the future pension benefits earned that year by workers, typically referred to as the normal cost. States and localities have historically failed to fully prefund pension benefits. Moreover, in recent years they have been cutting the level of DB pension benefits while simultaneously increasing pension funding (Lenney, Lutz, Schule, and Sheiner 2021). For these reasons and others, the value of pension benefits under cash accounting can diverge significantly from the value under the more appropriate accrual approach. Thus, the cash accounting for DB pensions in the NCS is a potentially serious measurement concern.

Given the above limitations, we turn to alternative, non-NCS data sources and approaches to measure the value of DB pensions, retiree health care, and job stability. For DB pension, both states, localities, and private firms are required to annually issue actuarial reports which calculate the pension normal cost for that year. However, these state and local reports are themselves problematic because state and local governments have traditionally used a discount rate equal to the assumed rate of return on risky plan assets, whereas standard principles of financial valuation suggest the discount rate should instead reflect the risk profile of the stream of future pension payments, which depends on the probability that the payments will be honored, among other factors. Given the relatively strong legal protections surrounding these payments, it is appropriate to use a discount rate lower than that implied by the expected return on pension plan assets (Novy-Marx and Rauh 2011; Lucas 2012). All else equal, a lower discount rate implies a higher valuation on annual DB pension benefits which will, in turn, increase the measured compensation of public workers relative to the private sector.

To address these issues, we turn to the Bureau of Economic Analysis's (BEA) National Income and Product Account (NIPA) data—i.e. the GDP accounts. In order to value the annual compensation due to defined benefit pension plans, the BEA adjusts the private and state and local actuarial reports to use a common discount rate. For state and local pensions, they apply a lower, more appropriate discount rate than the assumed return on plan assets (Lenze 2013). Using the methodology described in section IV.B.1, we use the BEA DB pension estimates to adjust the CPS and ECI-based estimates of relative public sector compensation.

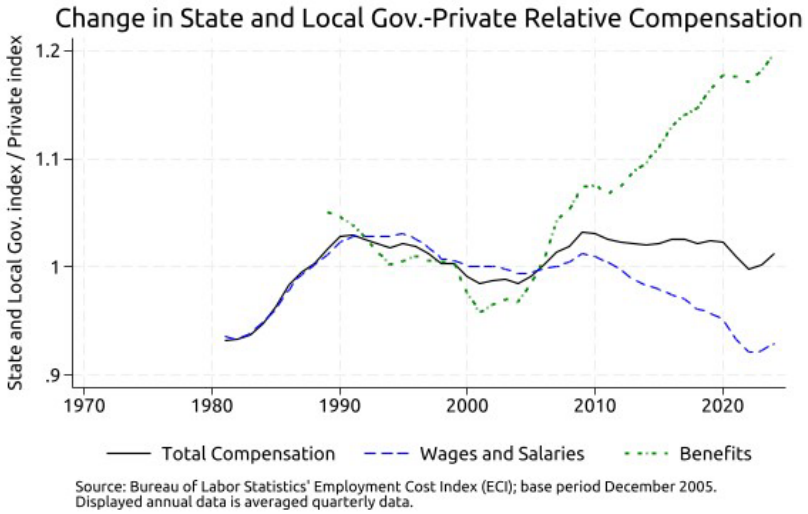
For retiree health care, we generate the annual accrual value using data from Pew (2023), the BEA, and the ECEC. The methodology is detailed in section IV.B.2. We estimate the value of job stability using CPS data and the methodology discussed in section IV.B.3.

Finally, an alternative approach to the one employed in this paper would be to simply use the NIPA data, adjusted to reflect retiree health care and job stability, to calculate relative public sector compensation. However, our approach, which is anchored in the use ECI and CPS data, has the significant advantage of permitting us to address compositional shifts in the public and private workforces over time. Moreover, our approach allows us to investigate how relative composition has changed over time for different subsets of workers, for example by education and age.

IV. Results

We start the examination of state and local government compensation differentials with the private sector by examining *trends* in relative compensation over time. The black line in Figure 1 displays the ratio of the state and local government total compensation index in the ECI to its the private sector counterpart; the series is indexed to equal 1 in 2005. The series can interpreted as capturing the percent change in the public pay premia relative to 2005. During the 1980s the public pay premia rose substantially; thereafter the premia declined gradually through 2005. From 2005 through 2010, the premia reversed as state and local workers gained on their private sector counterparts. These results are consistent with past research such as Poterba and Rueben (1994) and Gittleman and Pierce (2011).

Figure 1



After 2010, relative compensation as measured by the ECI held roughly constant through 2024. That said, the flat relative compensation over this period masks a stark shift in S&L relative compensation toward benefits and away from wages and salaries. In Figure 1 relative wages and benefits are shown by the dash blue line and dash-dot green line, respectively; they moved

broadly in tandem until around 2010. Since then, relative wages have tumbled, while relative benefits have soared. Next, we examine relative wages and benefits in more detail.

IV.A Wages

Relative public sector wages, holding industry, occupation, and "job" fixed, have declined by 8 percentage points through 2024 relative to their 2009 peak. While only a portion of total compensation, wages are likely particularly relevant to attracting new workers as they are the most salient component of compensation. Moreover, younger workers may place limited value on retirement benefits such as pensions and health care (e.g. Clark and Morrill 2016), and, as we show below, the value of these benefits is much lower for younger workers. More generally, workers of all ages may not fully value benefits such as pensions because of their complexity (e.g. Gustman and Steinmeier 2005, Fitzpatrick 2015, Ni and Podgursky 2016, Quinby 2020). Thus, the relative decline in state and local government wages may have important implications for these governments ability to attract and retain workers.

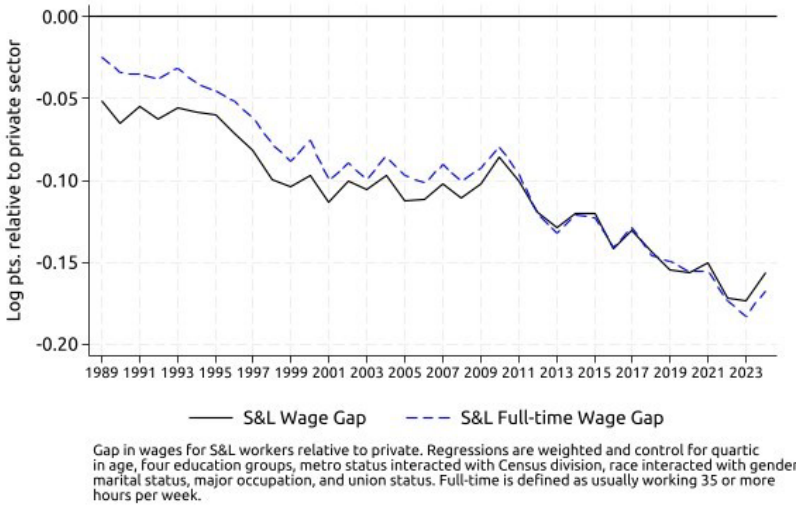
In order to confirm the results on the trend in relative public wages from the ECI, and to shed light on the level of relative wages, we turn to the CPS data. Unconditional average wages in the state and local government sector are higher than those in the private sector by about 15% from the 1990s through about 2015, after which S&L pay fell to only about 5% higher than in the private sector. However, workers in the two sectors differ along a number of important determinants of pay such as educational attainment. The unconditional CPS data provides comparisons of these dissimilar workers.

To compare pay of similar workers, we estimate Mincer-style regressions of hourly wages of workers using the CPS from 1989-2024. In particular, following the approach in the past literature—e.g. Katz and Krueger (1991), Poterba and Rueben (1994), and Gittleman and Pierce (2011)—for each year in the sample we regress the log of the wage on an indicator for whether the worker is a state and local government worker and include the following controls: a quartic in age, four education categories, marital status, Census division interacted with metro status, race interacted with gender, major occupation, and union coverage.[4] We weight the regression with the CPS survey weights to make the regression representation of an average worker.

Figure 2 displays the coefficients on the state and local government indicator. The results indicate that the relative pay of state and local workers leveled off at about 10% lower than comparable private sector workers from the late 1990s through about 2010. After the Great Recession, and coinciding with large deterioration in the budget positions of these governments, state and local government relative worker pay fell substantially. Thus, the evidence from the ECI and CPS paint a broadly similar picture of a steady decline in relative S&L wages since the Great Recession. In terms of the level of the public wage differential, by 2024 wages of public sector workers were a substantial 15% lower than their comparable private sector counterparts.

[4] See Gittleman and Pierce (2011) for a detailed discussion of the role of control variables in assessing public-private compensation differentials.

Figure 2
S&L government wages relative to private sector



IV.B Benefits

We now turn to examining relative differences in non-wage compensation. We focus on defined benefit pensions, retiree health care, and job stability as they are areas for which there are substantial measurement challenges not addressed by the ECI. That said, in our final accounting of the overall public sector compensation differential, we account for other benefits such health insurance.

IV.B.1 Defined Benefit Pensions

Unpublished data provided by the BLS, and displayed in Figure 3, reveals that the surge in relative public sector benefits displayed in Figure 1 is solely attributable to defined benefit (DB) pension plans. As shown by the blue dashed line, relative public benefits are flat once DB pensions are removed from the private and public indexes used to construct relative benefits.[5] The rise in relative pension benefits is surprising because states and localities have been reducing DB pension generosity both for current workers—e.g. cost-of-living-adjustment reductions—and particularly for new workers—e.g. the introduction of new, less generous benefit tiers (Lenney, Lutz, Schule, and Sheiner 2021). However, as discussed above, the ECI measures DB pension benefits on a cash basis which does not necessarily reflect the annual benefits being earned by workers.

[5] Private DB pensions have become a small share of private sector compensation. As a result, private sector DB benefits do not play an important role in the relative S&L benefits displayed in Figure 3.

Figure 3

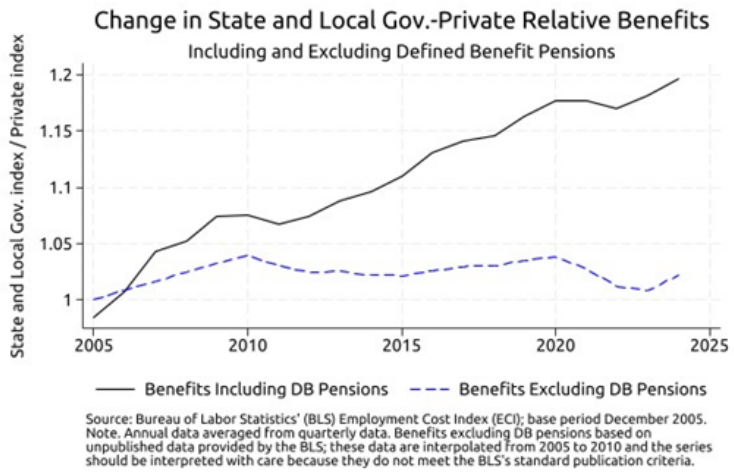


Figure 3a displays pension benefits per full-time equivalent worker on a cash and accrual basis from the NIPA. Benefits on an accrual basis were twice as large as benefits on a cash basis at the start of the sample in 2005. By 2023, though, cash benefits had eclipsed the accrual-based benefits. Figure 3b displays the indexed version of the cash and accrual S&L pension benefits. There is a very stark difference in the growth rates between cash and accrual accounting.

Figure 3a

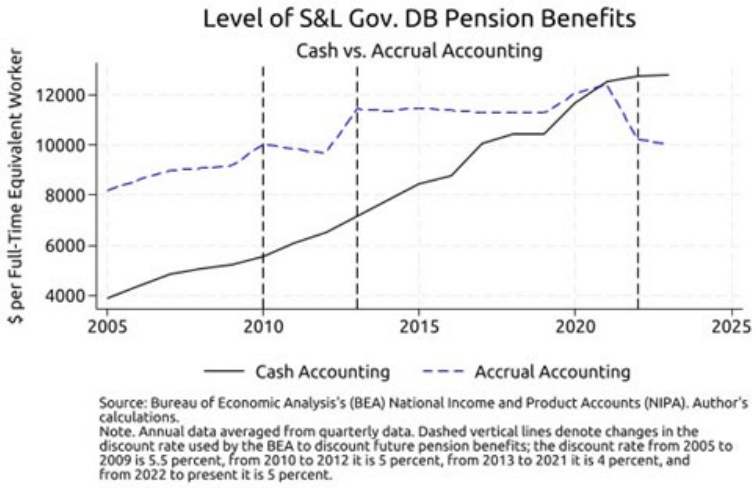
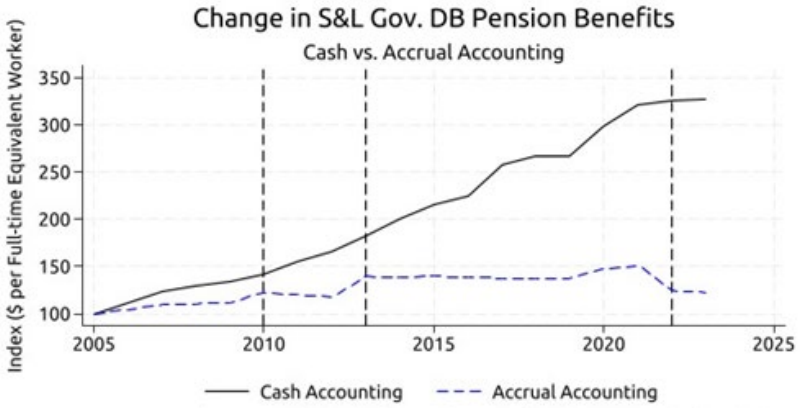


Figure 3b



Source: Bureau of Economic Analysis's (BEA) National Income and Product Accounts (NIPA). Author's calculations.
Note. Annual data averaged from quarterly data. Dashed vertical lines denote changes in the discount rate used by the BEA to discount future pension benefits; the discount rate from 2005 to 2009 is 5.5 percent, from 2010 to 2012 it is 5 percent, from 2013 to 2021 it is 4 percent, and from 2022 to present it is 5 percent.

As measured by cash accounting, there has been rapid growth in pension benefits. This is consistent with evidence in Lenney, Lutz, Schule, and Sheiner (2021) that states and localities have significantly increased their contributions to pension funds in recent years. However, this funding increase reflects total pension funding. Such funding can be lower than pension benefits earned that year if governments are underfunding pensions or greater than current year benefits if they are paying down legacy liabilities – i.e. addressing past years' underfunding.[6]

The accrual DB pension measure has also risen, although at a much slower pace than the cash measure. The rise in the accrual measure post-2010 appears to mainly reflect changes in the discount rate used to calculate the value of the future benefit streams. The dashed lines in Figures 3a and 3b show the points in time when the BEA adjusted the discount rate to reflect market changes in interest rates. In 2010 and 2012, the BEA reduced the discount rate to reflect the ongoing secular decline in rates which in turn boosted benefits. In 2022, the BEA raised the discount rate to reflect the surge in interest rates in the post-Covid environment, pushing down the value of benefits. These changes in the accrual measure are properly viewed as well-measured benefit changes because they reflect changes in the market price of buying a comparable annuity from a private source.

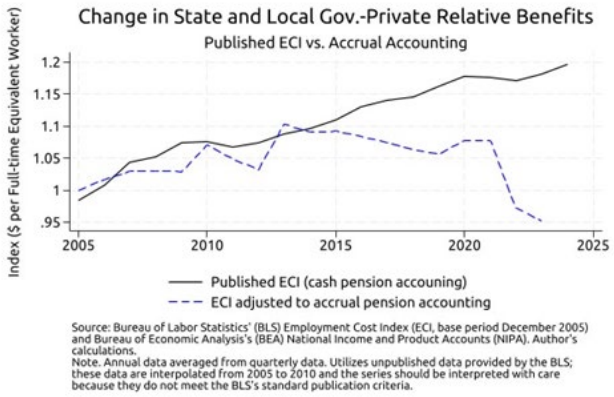
The lack of growth in the accrual pension measure, other than due to changes in the discount rate, is notable because the rise in nominal wages will, all else equal, increase the value of the benefits measured in nominal terms (as they are here). This lack of increase likely reflects the reduction in benefit levels mentioned above.

[6] The gap between the accrual and cash benefits in Figure 3a captures the shortfall of funding in that year relative to benefits earned that year (i.e. the normal cost). The gap does not capture the portion of the stock of past unfunded liabilities which standard actuarial methods dictate be amortized in that year.

Figure 4 displays the ECI relative total benefit index (displayed on Figure 1) adjusted to be on an accrual basis for DB pensions—the dashed blue line—using the NIPA data. The adjusted and unadjusted state and local government relative benefit indexes display similar growth through 2014. The similar growth rates in the two series may appear puzzling given the much more rapid growth in the cash DB pension index relative to the accrual-based index in Figure 3b. However, the more rapid growth in the cash measure is tempered by its relatively smaller size relative to the accrual measure in 2005 shown in Figure 3a; 2005 is the base index year which define the aggregation weights used to construct the total benefit index under accrual DB accounting index on Figure 4. Stated differently, in aggregating up the indexes in Figure 3b with the index for all other benefits to produce the series on Figure 4, the accrual-based measure receives significantly more weight than the cash-based measure.

After 2014 the accrual accounting total relative benefit measures in Figure 4 diverges sharply from the cash-based measure, declining gradually and then plunging in 2022 as the value of a DB pension benefits was eroded by the rise in interest rates. By 2023, the difference in total relative benefit growth between the published ECI total benefit index and the accrual DB pension based index is a substantial 23 percentage points. Thus, compared to the published ECI, correctly accounting for DB pension benefits leads to very different conclusions about relative benefit growth in the public sector.

Figure 4



One potential issue with the aggregation used to produce the accrual-based benefit index in Figure 4 is that the ECI isolates wage changes independent of compositional changes in industry, occupation, and employer. The DB pension index calculated from the BEA data does not hold such factors fixed and therefore reflects compositional shifts. However, available evidence suggests the distortion for failing to account for compositional shifts is not excessively severe. Appendix Figure A1 reveals the growth in state and local DB pension benefits measured on cash basis is very roughly similar when using the ECI and the NIPA, suggesting that the bias in using

the NIPA data to adjust the ECI is not excessive. We will attempt to address this concern more fully in the next draft of this paper.[7]

IV.B.2 Retiree Health Care

As with pensions, the Employment Cost Index (ECI) uses employer contributions to retiree health trust funds as the measure of the compensation value of employer-provided retiree health benefits. However, since these benefits are predominantly unfunded, the ECI effectively excludes them, failing to capture any changes in their value.[8] Given that most state and local governments offer these benefits to employees, while few private-sector employers do, this omission significantly skews public sector compensation measurements.

To address this disparity, we estimate both the current value of these benefits and their evolution over time, enhancing the assessment of public versus private sector compensation differences. Recent changes in accounting standards, specifically Government Accounting Standards Board (GASB) Statements No. 74 and 75, have mandated that governments report the estimated future cost of retiree health benefits and other non-pension post-employment benefits (OPEB). Consequently, from 2018 to 2022 (the latest data available), we can measure the OPEB normal cost—the annual accrual of retiree health benefits across all employees.

Our method for valuing these costs is as follows. We develop a streamlined actuarial model of the retiree health care normal cost for a single year (2019) that considers factors such as the discount rate, the current value of the benefit, average wages, employee age and tenure, projected wage and health cost growth, and anticipated mortality and turnover rates by age. Focusing on retiree health plans offered by state governments (which often extend to local workers), we adopt the approach of Lutz and Sheiner (2014) to extrapolate state normal costs to include local employees covered under other plans, assuming consistent normal costs between state and local plans. Notably, 15 states account for 90% of the aggregate normal costs; thus, our analysis centers on modeling these states for the 2019 fiscal year. Appendix section B provides a detailed overview of this model.

While we generally take the data inputs for the model from the 2019 retiree health care actuarial reports, we make adjustments to two variables: the discount rate and assumed health care cost growth. In terms of the discount rate, GASB standards require states to use a discount rate that reflects a blend of the expected return on investments and the municipal bond borrowing rate, with the proportion of funded liabilities determining the share of the blended discount rate equal to the municipal bond rate. As most plans are unfunded, the applied discount rate is typically the relatively low municipal bond rate—significantly lower than the discount rate used for pension liabilities.

[7] We adjust private DB pensions to reflect accrual accounting using the same method as for S&L pensions. However, by the start of the sample period in 2005, private DB pensions measured on either a cash or accrual basis had become a small share of private sector benefits. E.g. on an accrual basis as measured in the NIPA they comprised only around 8% of private sector benefits. Hence, they don't play a major role in the evolution of the accrual-based relative benefit series shown in Figure 4. Appendix Figure A2 displays the evolution of accrual-based and cash-based private sector DB pension benefits.

[8] Less than 10 percent of OPEB benefits have been prefunded by the states (Pew Charitable Trust 2023).

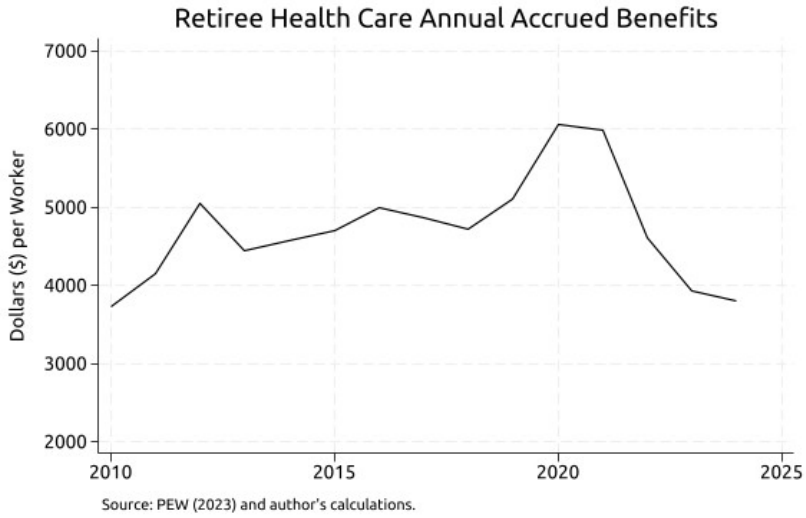
As already discussed in regards to pensions, however, the discount rate for future benefit liabilities should correspond to the risk profile of those benefits. Unlike pensions, retiree health insurance is not guaranteed and generally lacks strong legal protections; in most cases state and local governments can modify or terminate these benefits at their discretion. For instance, the Texas Employee Retirement System cautions: "The Texas Legislature determines the level of funding for such benefits and has no continuing obligation to provide those benefits beyond each fiscal year." Numerous states and localities have reduced the generosity of, or even eliminated, the benefit in the past (Clark, 2009; Franzel and Brown, 2013). Thus, for our analysis, we discount retiree health benefits using a rate that is 2 percentage points higher than the rate used by BEA to discount future pension benefits, with the higher rate reflecting the much higher uncertainty about whether these benefits will be available in the future. While we judge default risk as the dominant factor in setting the discount rate for retiree health care, the appropriate rate is a very complex issue with numerous factors to consider – see section 2.4 of Lutz and Sheiner (2014) for a discussion. Accordingly, in a future draft we will explore the sensitivity of our analysis to variation in the discount rate.

An essential determinant of retiree health insurance value is the projected rate of health cost inflation. We replace actuaries' assumptions with projections from the Congressional Budget Office (CBO) to ensure a more accurate valuation.

After estimating the benefit value for 2019, we adjust for prior and following years by considering the evolution in prior years of interest rates, health care cost growth, and retirement age and service years. First, we adjust for interest rates, which declined from 2010 to 2020 but have risen sharply in recent years. Higher discount rates reduce the value of future benefits. Second, the past decade has seen a notable slowdown in health cost growth, leading entities like the CBO and the Centers for Medicare & Medicaid Services (CMS) to revise their projections downward. We utilize CBO projections for each year, assuming that workers' expectations align with those of the CBO. Finally, many states have increased the service years required for full retirement eligibility and, in some cases, reduced retiree health plan generosity by demanding more service years or lowering the employer's contribution share, as shown in Appendix Table 1. In a future draft, we will account for these policy changes over time.

Our very preliminary findings indicate that, in 2024, the average nominal value of retiree health benefits was approximately $3,000 per worker in the state and local sector, a decrease from nearly $4,000 in 2010.

Figure 5



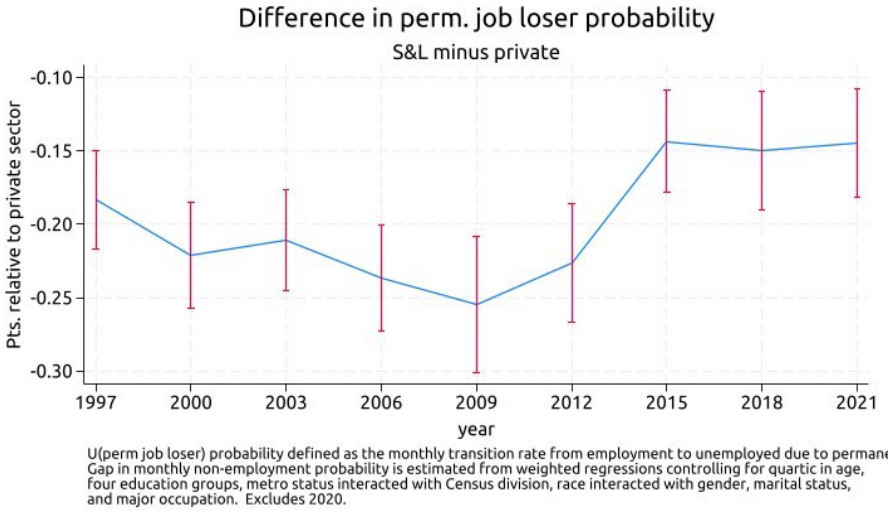
IV.B.3 Job Stability

In addition to wages and benefits, jobs are valuable to workers if they are more stable and secure. Government jobs are typically viewed as less prone to layoff or job loss risk. However, little research has shed light on how relative job stability between the sectors has changed over time.

To estimate the change in job stability over time, we estimate linear probability models akin to the wage regressions shown above in section IV.A using longitudinally-linked CPS data. In particular, we estimate monthly job loss probabilities among private and state and local government workers. We define job losers as those experiencing a transition from employment to unemployment due to a permanent job loss. The results are qualitatively similar if we examine any type of employment-to-unemployment transition or if we include transitions of those who leave the labor force but report wanting a job. Because job loss probabilities are notably different for school-age and retirement-age workers, we restrict this analysis to those aged 25-54, and control for a similar set of characteristics as in the wage analysis (omitting union coverage which is unavailable outside of the ORG data). We pool three years of data together due to the smaller sample sizes when matching data longitudinally.

As shown in Figure 6, we find that the job loss probability of S&L workers relative to similar private-sector workers improved from the late 1990s through the Great Recession, with the difference falling to 0.25 percentage point in 2009 (or a difference of about 38% on the average rate of permanent job loss over the sample period). However, since 2012, the job loss rate has risen for S&L workers relative to private-sector workers to a gap of about 0.15 percentage point. Thus, the loss in relative job stability of state and local government workers compounded the decline in relative wages and benefits that occurred over roughly the same time period.

Figure 6



How do workers value changes in job loss rates, compared to changes in other aspects of compensation such as wages? The value of a job to a worker can be thought of as the present discounted value of the flow of wages, discounted by the chance of losing the job and time preference. However, the cost of a job loss also depends on how easy it is to find a comparable job, such that more easily finding a replacement job renders job loss less costly. In Appendix C we derive a simple formulation of this logic. Using standard assumptions for discounting and job-finding rates, the model in Appendix C suggests that a 10% increase in the job loss probability is equivalent to about 2.5% decrease in the wage. Thus, the increase in the relative job loss rate shown in Figure 6 would have been roughly equivalent to a further 1¾ percent to 3¾ percent decline in wages relative to private-sector workers, on top of the roughly 10% decline in wages shown in the ECI and CPS data above. In terms of the level of wages, in 2021-2024 (excluding 2020) period, the value of greater job stability is equivalent to about a 4% wage premium for state and local workers relative to the private sector.

IV.C Comparing Total Compensation

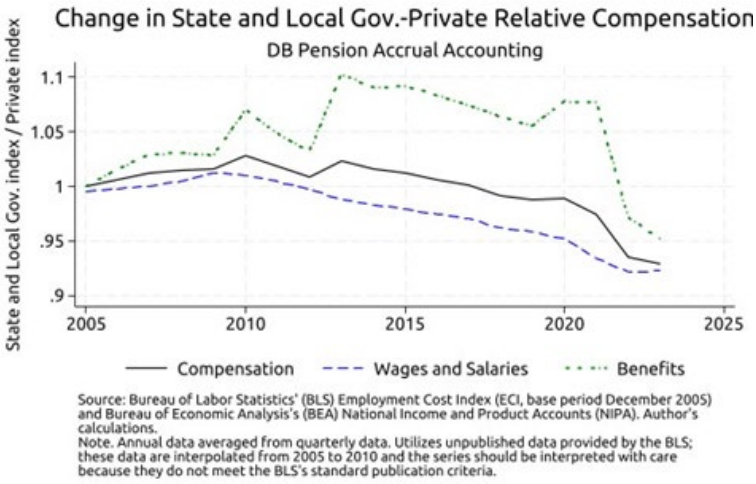
In this subsection we combine the benefit value measures presented above with the CPS and ECI to obtain total relative compensation comparisons.

II.C.1 Trends in Relative Total Compensation

Figure 7 shows our very preliminary estimate of the ECI-based trend in public sector total compensation relative to the private sector. To generate the estimate, we aggregate the ECI data on wages and benefits excluding DB pensions with our accrual-based valuation index measure for DB pensions. Incorporating accrual accounting for DB pensions alone—i.e. failing to account for the downward trends in retire health care value and job stability—significantly alters the trajectory of relative S&L compensation since 2010. Instead of flat relative compensation over the entire post-2010 period as displayed using the published ECI data in Figure 1, relative compensation erodes steadily starting around 2015 and then falls substantially in the post-Covid period. The post-Covid decline mostly reflects a plunge in the value of pension accruals due to

the sharp rise in interest rates. The incorporation in future drafts of both retiree health care and job stability valuation trends will work to steepen the downward trajectory further.

Figure 7



IV.C.1 Level of Relative Total Compensation

In order to estimate the absolute level of the public relative wage premia—which is not possible with the ECI-based approach—we turn to the CPS data. In particular, as outlined in Appendix section D, we combine the conditional CPS wage analysis in section IV.A, which controls for worker characteristics, with the benefit valuation measures developed in section IV.B.

Figure 8

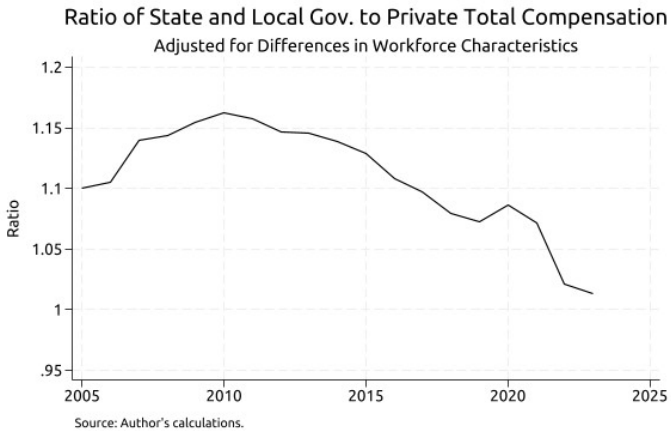


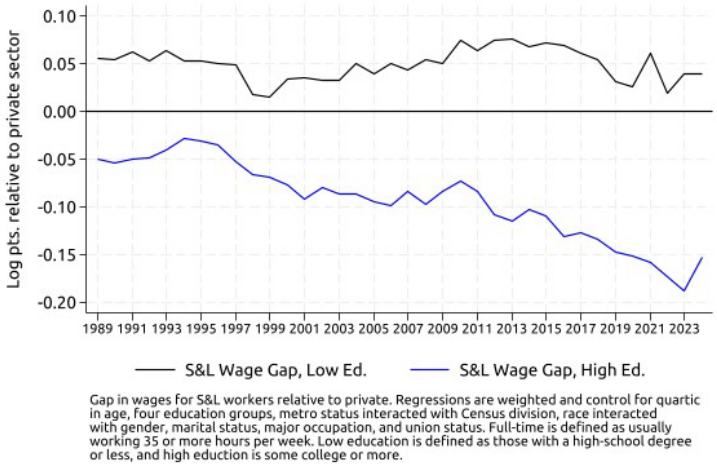
Figure 8 presents the relative total public compensation differential expressed as a percent deviation of public compensation from private compensation – i.e. a value of 1 indicates parity in compensation across the sectors. At the onset of the Great Recession, this very preliminary evidence suggests that state and local workers were overcompensated by 15 percent relative to their private sector peers. This differential, however, dwindles over the ensuing years such that

as of 2024 there is essentially no public premium at all; i.e. state and local workers were being paid the same as their private sector counterparts.

IV.D Relative Compensation by Age and Education

We now turn to assessing public-private compensation differentials by groups—e.g. by educational attainments. Figure 9 displays the results of repeating the CPS-based relative wage analysis of Figure 2 by education; low education signifies a high school degree or less and high education signifies some college or more. Low wage workers, shown by the black solid line, display a small, positive wage premium relative to their private sector counterparts. The trend in their relatively compensation is essentially flat. In contrast, higher education workers, shown by the blue line, display a notable downward trend from the mid-1990s onward. As of 2024, these workers' wages are estimated to be about 15 percent lower than in the private sector. Future drafts of this paper will calculate analogous total compensation differences by education (i.e. we will incorporate benefits and job stability). We will also examine differentials for other groups such age (of significant interest given the prevalence of DB pension benefit tiering which reduces benefits only for new workers.)

Figure 9
S&L government wages relative to private sector by Education



V. Conclusion

Our analysis demonstrates that the compensation premium for state and local government workers relative to comparable private sector employees has significantly eroded over the past fifteen years, effectively disappearing by 2024. The convergence in compensation between sectors reflects a combination of factors: declining relative wages, diminished public retiree health benefits, and reduced job stability in public employment. A methodological contribution of this paper—specifically our correction of the cash accounting bias in the ECI's treatment of defined benefit pensions—reveals that this standard data source has systematically overestimated

relative public sector compensation growth in recent years. Our findings are relevant to the future capacity of state and local governments to recruit and retain qualified personnel.

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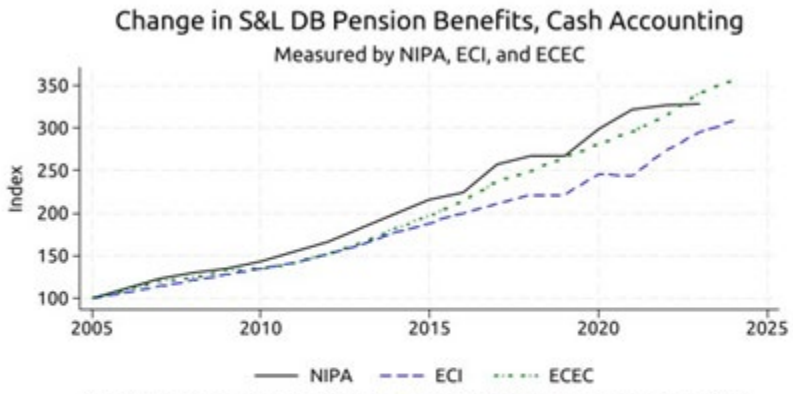
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Appendix

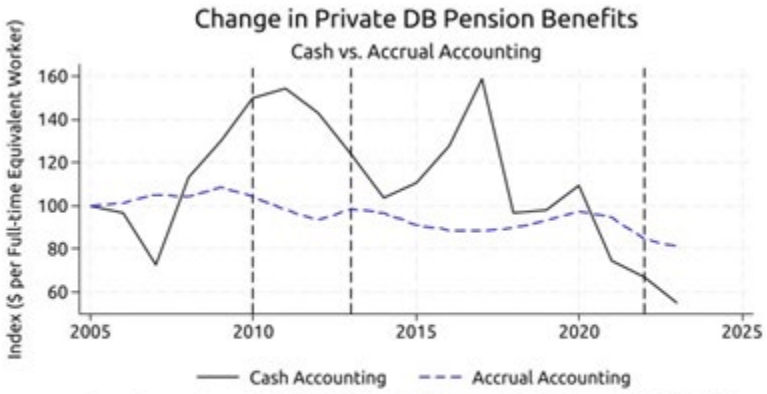
A. Figures

Figure A1



Source: Bureau of Labor Statistics' (BLS) Employment Cost Index (ECI, base period December 2005) and Employer Costs for Employee Compensation (ECEC). Bureau of Economic Analysis's (BEA) National Income and Product Accounts (NIPA). Author's calculations.
Note. Annual data averaged from quarterly data. ECI series is unpublished data provided by the BLS; these data are interpolated from 2005 to 2010 and the series should be interpreted with care because they do not meet the BLS's standard publication criteria. BEA series is indexed version of defined benefit pension benefits measured in dollars per full-time equivalent worker.

Figure A2



Source: Bureau of Economic Analysis's (BEA) National Income and Product Accounts (NIPA). Author's calculations.
Note. Annual data averaged from quarterly data. Dashed vertical lines denote changes in the discount rate used by the BEA to discount future pension benefits; the discount rate from 2005 to 2009 is 5.5 percent, from 2010 to 2012 it is 5 percent, from 2013 to 2021 it is 4 percent, and from 2022 to present it is 5 percent.

B. OPEB Modeling

To be included in a subsequent draft.

C. Job Loss Cost Modeling

Consider a worker who can either be employed or unemployed. If employed, she receives the wage w and faces the job-destruction rate δ. If unemployed, the worker receives unemployment benefits proportial to the wage at the replacement rate γ and faces the job-finding rate$f$. The present value of being employed and unemployed are given by

$$W = \frac{w + \delta U}{r + \delta}$$
$$U = \frac{\gamma w + fW}{r + f}$$

Manipulating the prior two equations, one can express the effect of wages and job destruction rates on the present discounted value of a job to workers:

$$dlnW_i = dlnw_i - \delta_i dln\delta_i \left(\frac{1}{r + f_i + \delta_i} - \frac{\gamma}{r + f_i + \gamma\delta_i}\right)$$

Changes in wages feed through one-for-one to the value of jobs whereas changes in the job destruction rates alter the value of jobs by only a fraction, depending on the various parameters. Assuming the following standard parameters,

$$\gamma = 0.5\ (UI\ replacement\ rate)$$

$$f_i = 0.4\ (job\ finding\ rate)$$

$$\delta_i = .02\ (job\ separation\ rate)$$

$$r = \frac{.05}{12}(5\%\ annual\ interest\ rate)$$

would imply the coefficient on $dln\delta_i = -0.023$, meaning every 10% increase in the job destruction rate reduces the value of a job by 2.3%.

D. Level of Relative Total Compensation Methodology

The ECI holds constant job characteristics, but we are unable to do that with pensions and other retiree health benefits. However, given that virtually all state and workers receive pension benefits and retiree health benefits, it seems unlikely that the ratio of benefits to wages will be overly affected by compositional change.

Our analysis precedes as follows: As shown in the main body of the paper in Figure 2, we estimate that wages in the public sector were about 15% lower than in the private sector after correcting for differences in the composition of employees across the sector. We then use the Bureau of Labor Statistics' Employer Costs for Employee Compensation (ECEC) to adjust the ECI benefits. We then replace the pension benefits in the ECEC with an accrual-based measure of benefits accrued per hour, and add as an additional benefit retiree health accrued per hour. We then calculate the ratio of benefits to wages for the public sector and the private sector. Our estimate of the total compensation differential excluding the benefits of job stability are as follows:

$$\frac{\boldsymbol{TC_{SL}}}{\boldsymbol{TC_{Private}}} = \frac{\boldsymbol{W_{SL}} * (\mathbf{1} + \boldsymbol{benshare_{SL}})}{\boldsymbol{w_{Private}}(\mathbf{1} + \boldsymbol{benshare_{private}})}$$

Finally, we gross up the measure to reflect the value of job stability presented in section IV.B.3. For example, in 2024, we increased the State and Local wage by 4% to account for the greater job stability.

Appendix Table 1: Retiree Health Insurance Reforms

	Share of Aggregate Normal Cost	Reform 1	Reform 1 Affects	Reform 2	Reform 2 Affects:
Texas	22%	Reduced State share of premium if < 20 years of service (State pays 50% for 10-14, 75% for 15-19, but still 100% for 20+)	Employees with <5 years of service as of 9/1/2014	Increased Required years of Service from 5 to 10	Employees hired after 9/1/2009
California	15%	Reduced state share of premium from 100/90 (retiree/dependent) to 80/80	Employees Hired after 1/1/ 2017 or 1/1/2016, depending on bargaining unit	Increased min retirements age from 50 to 52	Employees hired after 1/1/2013
Illinois	14%	Required retirees to pay 1% of pension benefit if on Medicare, 2% if pre-Medicare as health insurance premium; increased to 2%/4% in 2015.	2014-2015. Then ruled unconstitutional.		
New York	6%	NONE			
Georgia	5%	Reduced subsidy for < 30 years of service, with contribution rangins from 15% of premium (10 years 0f service) up to 75% (30 years of service).	Employees with <5 years of service as of 1/1/2012		
New Jersey	4%	Increased retiree share of premium, with increase largest for those with the largest pensions.	Employees/retirees with less than 20 years of service as of 6/2011		
North Carolina	3%	Eliminated Retiree Health Insurance - reduced from 50% premium (10-20 years of service) and 100% premium (20+) paid by state	Employees hired after 1/1/2021		
Massachusetts	3%	Lowered state contribution from 80% to 75% of premium	Employees hired after 7/1/2003		
Florida	3%	Florida maintained $5 nominal contribution per month per year of service from 2001 to 2023; raised it to $7.50 7/1/2023			
Michigan	3%	Changed system to a matching contributory system where employees contribute 2% of payroll to retiree health and state matches it .	Employees hired after 1/1/2012		
Connecticut	2%	Increased # years of contributions from 10 to 15.	Employees hired after 7/1/2017	State required employees to contribute 3% of pay toward retiree health for a period of 10 years	First employees with <5 years of service as of 2009, then expanded to all employees in 2011.
South Carolina	2%	Lowered state contribution for employees with less than 25 years of service (now: 5-15 eligible, but full premium; 15-25, eligible but pay employee premium + 50% employer premium); 25+ pay only employee premium	Employees hired after 5/2/2008		
Alabama	2%	2% reduction in the employer share of the premium for each year of service less than 25 will be increased to 4%. In addition, a 1% reduction in the employer share of the premium will be added for each year of age less than the Medicare entitlement age. This additional age premium component will be removed upon attaining Medicare entitlement.	Retiring on or after 1/1/2012.	Sliding scale premium introduced in 2005, where premium depends on years of service; 2% reduction from 100% (of employer share) for each year of service<25 (and 2% increase > 25, presumably paying some of employee share).	
Maryland	2%	Not much -- switched beneficiaries to Medicare Part D plans			
Ohio	2%	Reduced employer contribution to fixed $ amount (based on years of service and Medicare/non-Medicare) rather than share of premium.	2022 all retirees		
Total	89%				