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The teacher pay gap is wider than ever

Teachers' pay continues to fall further behind pay of comparable workers

Report • By Sylvia A. Allegretto and Lawrence Mishel • August 9, 2016

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SECTIONS

1. Summary • 1
2. Introduction and key findings • 1
3. Data sources • 4
4. Recent trends in relative weekly wages • 6
5. Relative teacher wages • 7
6. State wage analysis: Ratios overall and by state • 13
7. Adding benefits to the picture • 14
8. Conclusion • 19

About the authors • 20
Appendix A • 20
Appendix B • 24
Appendix C • 25
Endnotes • 26
References • 27

Summary

What this report finds: The teacher pay penalty is bigger than ever. In 2015, public school teachers' weekly wages were 17.0 percent lower than those of comparable workers—compared with just 1.8 percent lower in 1994. This erosion of relative teacher wages has fallen more heavily on experienced teachers than on entry-level teachers. Importantly, collective bargaining can help to abate this teacher wage penalty. Some of the increase in the teacher wage penalty may be attributed to a trade-off between wages and benefits. Even so, teachers' compensation (wages plus benefits) was 11.1 percent lower than that of comparable workers in 2015.

Why this matters: An effective teacher is the most important school-based determinant of education outcomes. It is therefore crucial that school districts recruit and retain high-quality teachers. This is particularly difficult at a time when the supply of teachers is constrained by high turnover rates, annual retirements of longtime teachers, and a decline in students opting for a teaching career—and when demand for teachers is rising due to rigorous national student performance standards and many locales' mandates to shrink class sizes. In light of these challenges, providing adequate wages and benefits is a crucial tool for attracting and keeping the teachers America's children need.

Introduction and key findings

An effective teacher is the most important school-based determinant of education outcomes.[1] Therefore it is crucial that school districts recruit and retain high-quality teachers. This is increasingly challenging given that the supply of teachers has been greatly affected by high early to mid-career turnover rates, annual retirements of longtime teachers, and a decline in students opting for a teaching career.[2] At the same time, many factors are increasing the demand for teachers, including shrinking class sizes, the desire to improve diversity, and the need to meet high

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standards. In short, the demand for teachers is escalating, while simultaneously the supply of teachers is faltering.

The supply of teachers is diminishing at every stage of the career ladder. On the front end, fewer students are entering the profession. Generally speaking, the small fraction of the most cognitively skilled college students who elect to become teachers has declined for decades (Corcoran, Evans, and Schwab 2004). Several factors have helped to drive this trend. Over the long run, employment opportunities for women have greatly expanded, and thus the teaching profession can no longer rely on what was a somewhat captive labor pool. At the same time, teachers are less satisfied and more stressed as standardized testing has been elevated as a tool for student, school, and teacher evaluations.[3]

On the back end, teachers are aging and retiring along with the workforce overall. Teacher retirements recently peaked, going from 35,000 in 1988–1989 to 87,000 in 2004–2005 (and down very slightly to 85,000 in 2008–2009) (Ingersoll, Merrill, and Stuckey 2014). Ingersoll, Merrill, and Stuckey (2014) argue that retiring teachers, who represent fewer than one-third of those who leave the profession, are not the primary driver behind teacher shortages. Regardless, they do represent a nontrivial annual reduction in the teacher workforce. Moreover, as teachers retire, they are replaced by newcomers, and the high attrition rate among this group is a particularly critical issue.

Teacher staffing is significantly affected by early and mid-career teachers who leave the profession for non-retirement reasons. Ingersoll, Merrill, and Stuckey (2014, 7) document that "from 1988-89 to 2008-09, annual attrition from the teaching force as a whole rose by 41 percent, from 6.4 percent to 9 percent," a trend driven primarily by non-retirement turnover. They conclude that teachers, who represent one of the largest occupations in the nation, have been leaving at relatively high rates, and these rates have steadily increased in recent decades. The increasing rates of attrition foster a growing instability in the teaching profession that affects classroom efficacy.

More recently, the outward flow of teachers was worsened during the Great Recession and the ensuing slow recovery. Many states made austere cuts in public spending, which included major teacher layoffs. Eight years after the economic implosion, many states have yet to return to their prerecession teacher levels, even as demand has increased.[4]

Darling-Hammond et al. (2016, iii) in their study of California aptly summarized the overall situation:

> "On the supply side, overall desirability of teaching as a profession is the most important factor; others include ease of entry, competitiveness of salaries, and teaching conditions. Highly publicized teacher layoffs during the budget downturn left a mark on the public psyche, including that of individuals who might have been considering a teaching career. In addition, salaries were frozen and working conditions suffered during the era of cutbacks, as resource limitations led to increased class sizes, along with fewer materials and instructional supports. One sign of the impact is that only 5 percent of the students in a recent survey of

visited on 12/6/2017

> college-bound students were interested in pursuing a career in education, a decrease of 16 percent between 2010 and 2014."

At the same time, there are many important factors placing pressures on the current and future demand for teachers overall, and in selected fields and for selected purposes. First, rigorous national standards and school-based accountability for student performance have raised the demand for talented teachers.

Second, an increasingly diverse workforce and student population should be met with a more diverse teacher workforce, increasing the demand for certain types of teachers. As shown in Allegretto and Tojerow (2014), whites are overrepresented as teachers (compared with their representation in the overall workforce and, especially, the student population). Conversely, blacks are underrepresented as teachers and Latinos even more so. As Ingersoll, Merrill, and Stuckey (2014) note, there have been successful recruiting efforts of minority teachers, and these teachers are more likely to work in underserved urban communities with high poverty rates. More such efforts are required. It is also curious that nearly three-fourths of teachers are female, and that share has actually increased over time as the small share of male teachers has shrunk. One may think that more male teachers would benefit all students, but the lack of males in the profession is not well understood.

Furthermore, many locales' mandate to shrink class sizes also affects teacher demand. Class sizes in many schools across the nation are far too large. Lastly, broadening the scope of teacher demand is the constant need to fill specialized positions, such as in math, science, and special education—positions that are increasingly difficult to fill.[5] These are among the many reasons we may expect demand for teachers to continue to outstrip supply.

To address teacher shortages, it is necessary to focus on both recruiting and retaining high-quality teachers. Many policies are needed to accomplish this goal, and providing appropriate compensation is a necessary, major tool in addressing shortages. As Darling-Hammond et al. (2016, 18) note:

> "Even if teachers may be more motivated by altruism than some other workers, teaching must compete with other occupations for talented college and university graduates. ... Teachers are more likely to quit when they work in districts with lower wages and when their salaries are low relative to alternative wage opportunities, especially in high-demand fields like math and science."

The compensation issues affecting the worsening teacher shortage concern *relative* teacher pay—that is, teacher pay compared with the pay of other career opportunities for potential and current teachers. For over a decade, starting with *How Does Teacher Pay Compare* (Allegretto, Corcoran, and Mishel 2004), we have studied the long-term trends in teacher pay. We followed this up with *The Teaching Penalty*, published in 2008 using 2006 data, and have updated our findings occasionally in other papers.[6] Our body of work has documented the relative erosion of teacher pay. In 1960, female teachers enjoyed a wage premium compared with other college graduates. By the early 1980s, the teacher

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premium became a penalty, and the female teacher pay gap post-1996 has widened considerably.

Here we extend our analysis through 2015 and update our work on both wages and total compensation (wages plus benefits). (Note that throughout this report, "pay" is used as a generic term to refer to wages or compensation.) With this update, we continue to document trends in relative teacher pay and sound the alarm regarding the long-run growth in the wage and compensation penalty (also referred to in this report as a wage or compensation "gap")—the percent by which public school teachers are paid less than comparable workers. Specifically:

- Average weekly wages (inflation adjusted) of public-sector teachers *decreased* $30 per week from 1996 to 2015, from $1,122 to $1,092 (in 2015 dollars). In contrast, weekly wages of all college graduates rose from $1,292 to $1,416 over this period.
- For all public-sector teachers, the relative wage gap (regression adjusted for education, experience, and other factors) has grown substantially since the mid-1990s: It was -1.8 percent in 1994 and grew to a record -17.0 percent in 2015.
- The relative wage gap for female teachers went from a premium in 1960 to a large and growing wage penalty in the 2000s. Female teachers earned 14.7 percent *more* in weekly wages than comparable female workers in 1960. In 2015, we estimate a -13.9 percent wage gap for female teachers.
- The wage penalty for male teachers is much larger. The male teacher wage gap was -22.1 percent in 1979 and improved to -15.0 percent in the mid-1990s, but worsened in the late 1990s into the early 2000s. It stood at -24.5 percent in 2015.
- While relative teacher wage gaps have widened, some of the difference may be attributed to a tradeoff between pay and benefits. Non-wage benefits as a share of total compensation in 2015 were more important for teachers (26.6 percent) than for other professionals (21.6 percent). The total teacher compensation penalty was a record-high 11.1 percent in 2015 (composed of a 17.0 percent wage penalty plus a 5.9 percent benefit advantage). The bottom line is that the teacher compensation penalty grew by 11 percentage points from 1994 to 2015.
- The erosion of relative teacher wages has fallen more heavily on experienced teachers than on entry-level teachers. The relative wage of the most experienced teachers has steadily deteriorated—from a 1.9 percent advantage in 1996 to a 17.8 percent penalty in 2015.
- Collective bargaining helps to abate the teacher wage gap. In 2015, teachers not represented by a union had a -25.5 percent wage gap—and the gap was 6 percentage points smaller for unionized teachers.

Data sources

We first provide a brief overview of the two sources of data used in this analysis. For our wage analysis we use data from the Current Population Survey (CPS), and we use the

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Employer Costs for Employee Compensation survey to analyze benefits. Both are from the Bureau of Labor Statistics (BLS).

For our wage analysis we use CPS data on individual workers from 1979 through 2015. The CPS is a monthly survey of more than 60,000 households conducted by the Census Bureau for the BLS. We specifically employ the "Outgoing Rotation Groups" sample, or CPS-ORG. The CPS-ORG is one of the data sources most widely used by economists to study wages and employment. The CPS-ORG data are particularly useful due to their large sample and information on weekly wages. We pool monthly data into a series of annual data with over 150,000 workers for each year. This analysis restricts the sample to all full-time workers age 18 to 64 (defining "full time" as working at least 35 hours per week). Teachers are identified using detailed Census occupation codes, and include only elementary, middle, and secondary teachers (pre-kindergarten and kindergarten teachers, adult educators, and special education teachers are excluded). We also focus only on public school teachers (private school teachers—who on average earn less than public school teachers—are excluded).[7] We also restrict our analysis to data reported by survey respondents and thus do not include imputed data. A more extended discussion regarding the CPS-ORG data can be found in **Appendix A** of this paper and also in Appendix A of Allegretto, Corcoran, and Mishel (2008).

There are several measurement and data issues regarding the CPS that require some further discussion. First, as in our earlier work, we justify our choice of comparing weekly, as opposed to annual or hourly, earnings. Second, we discuss the method and data used in our benefits calculation.

Weekly wage

Our analysis of the relative wage of teachers relies on comparisons of weekly earnings, and not on annual or hourly earnings as analyzed by some researchers. As discussed in our prior work, we elect to use weekly wages to avoid measurement issues regarding differences in annual weeks worked (teachers' traditional "summers off") and the number of hours worked per week that arise in many studies of teacher pay. It is often noted that the annual earnings of teachers cannot be directly compared with those of non-teachers, given that teachers are typically only contracted to work a nine-month year. But differences arise over exactly how much time teachers devote to their position outside of their nine contracted months of teaching—and they are afforded little time off during the teaching year compared with other professionals. Teachers also spend some of their summer months in class preparation, professional development, or other activities expected of a professional teacher. Similarly, attempts to compare the hourly pay of teachers and other professionals have resulted in considerable controversy by setting off an unproductive debate about the number of hours teachers work at home versus other professionals.[8] Importantly, decisions regarding pay interval (weekly, annual, or hourly) become mostly irrelevant when considering changes in relative pay over time. Changes in relative wages can be expected to be similar as long as the relative work time (between teachers and comparable professionals) remains constant.[9]

visited on 12/6/2017

Benefits

Our analysis examines the relative wages of teachers but also examines how differences in benefits affect total compensation. We utilize the Employer Costs for Employee Compensation (ECEC) survey from the BLS to analyze the benefits of teachers compared with the benefits received by other professionals. The ECEC is a quarterly survey that reports employers' average hourly cost for total compensation and its components. It provides cost data in dollar amounts and as percentages of compensation. The ECEC decomposes total compensation costs into wages and benefits. Data are reported separately for broad benefit categories such as paid leave, supplemental pay, insurance, retirement and savings, paid holidays, health insurance, defined benefit pension, and workers' compensation. The ECEC reports compensation statistics for public- and private-sector workers and also provides data by occupation, including "primary, secondary and special education" teachers specifically. This allows us to compare relative teacher benefits. Our estimates of relative teacher wages and benefits give us a measure of relative total compensation of teachers as compared with other professionals.

Recent trends in relative weekly wages

We begin by analyzing average weekly wages (adjusted for inflation) for teachers and comparable workers. **Figure A** presents average wages for full-time workers age 18–64 for three groups: all workers, college graduates (not including public school teachers), and public school teachers. In 1979, all workers earned (in 2015 dollars) an average of $825 per week, compared with $911 and $1,159 for public school teachers and other college graduates, respectively. As noted in Appendix A non-imputed data are not available for 1994 and 1995; data points for these years have been extrapolated and are represented by dotted lines in the figure.

In 1979 teachers earned 10.3 percent more than all workers—which includes all levels of education. The gap between the higher wages of teachers compared with all workers widened to nearly 26 percent before narrowing to just 5.7 percent in 2015. The average weekly wage for all workers increased from $891 to $1,034 from 1996 to 2015—while teachers' wages *decreased* $30 per week, from $1,122 to $1,092. Thus, in 2015 teachers earned, on average, $59 more per week as compared with all workers—down from a $231 difference in 1996.

The most relevant comparison, however, is between teachers and other college graduates. In 1979 teachers earned 21.4 percent less than other college graduates. The gap between teachers and other college graduates narrowed into the mid-1990s but then widened considerably during the tight labor markets of the late 1990s into the early 2000s.[10] There was a 53 percent jump in wages for non-teacher college graduates from 1979 to 2002 during an unusual recent time of exceptional wage growth. This was a time when inflation-adjusted wages grew strongly among low-, middle-, and high-wage earners—but this was not the case for teachers. This is due to the long-term contracts teachers have and the fact that public-sector wages are not as volatile (both up and down)

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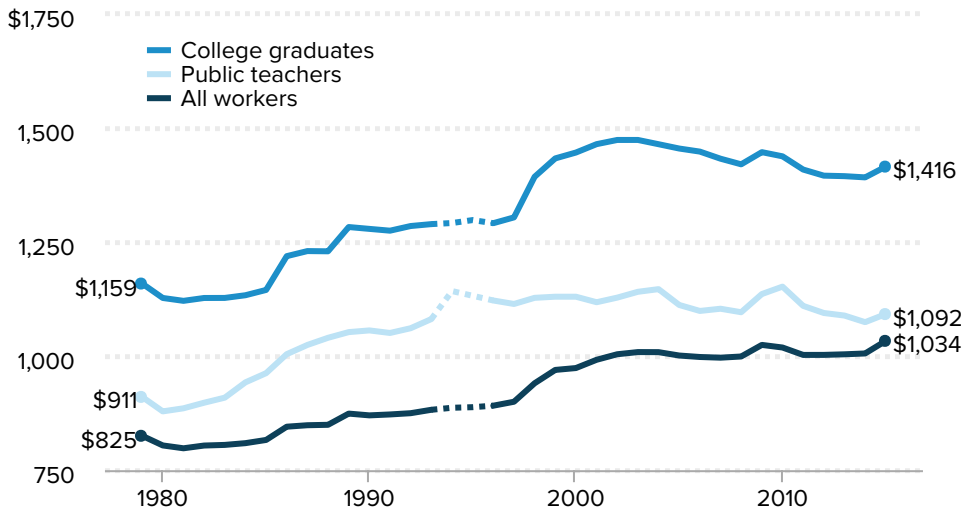
Figure A

Teachers' weekly wages are 23 percent lower than those of other college graduates

Average weekly wages of public school teachers, other college graduates, and all workers, 1979–2015 (2015 dollars)



Note: "College graduates" excludes public school teachers, and "all workers" includes everyone (including public school teachers and college graduates). Wages are adjusted to 2015 dollars using the CPI-U-RS. Data are for workers age 18–64 with positive wages (excluding self-employed workers). Non-imputed data are not available for 1994 and 1995; data points for these years have been extrapolated and are represented by dotted lines (see Appendix A for more detail).

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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as private-sector wages. The gap has been fairly consistent throughout the 2000s; teachers' wages slightly declined, as did wages for other college graduates. In 2015 the teacher wage disadvantage compared with other college graduates was 22.8 percent, or $323 per week—substantially higher than the 13.1 percent disadvantage in 1996.

Relative teacher wages

Next we turn to regression analysis to determine the relative wages of teachers. Regression-adjusted estimates account for any changes in the composition of the workforce and among college graduates over time. This typical wage model controls for education, age as a quartic, gender, marital status, geographic region, and race/ethnicity. To present wage gaps in percentage terms we exponentiate the estimated coefficients and subtract 1. We also expand our analysis to examine trends by gender.

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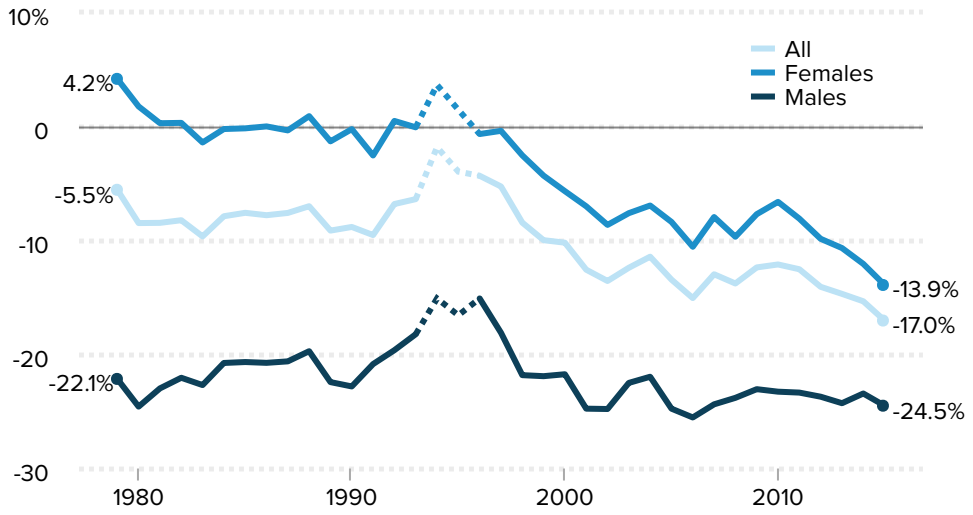
Figure B

The teacher wage gap grew from -5.5 percent in 1979 to a record -17.0 percent in 2015

Wage gap between public school teachers and similar workers, 1979–2015



Note: Figure compares weekly wages. Regression-adjusted estimates include controls for age (quartic), education, race/ethnicity, geographical region, marital status, and gender for the pooled sample. Data are for workers age 18–64 with positive wages (excluding self-employed workers). Non-imputed data are not available for 1994 and 1995; data points for these years have been extrapolated and are represented by dotted lines (see Appendix A for more detail).

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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Overall results

Relative trends in teacher wages are presented in **Figure B** (all estimates are listed in **Appendix B**). The overall wage gap grew from -5.5 percent to a record -17.0 percent from 1979 to 2015. The gap was fairly stable from 1979 to the mid-1990s but then grew more negative, especially from the mid-1990s into the early 2000s—confirming what we presented in Figure A. After some variability in the mid-2000s, the increasingly negative teacher wage gap continued worsening from 2010 through 2015—particularly for female teachers. It is noteworthy that the wage penalty lessened in the early portion of the Great Recession as private-sector wages fared worse than those in the public sector. This trend was more than reversed in the recovery beyond 2011 as state and local austerity sapped teacher wage growth while private-sector wage growth accelerated.

As illustrated in Figure B, teacher wage differentials vary greatly by gender. The wage gap currently stands at -13.9 percent for women. As a profession, teaching was relatively good for females in 1979, as they made 4.2 percent *more* than other comparable female college graduates. Our earlier work examining prior decades also found a wage premium for female teachers—14.7 percent in 1960, 10.4 percent in 1970, and 2.9 percent in 1980 (Allegretto, Corcoran, and Mishel 2008, 7). This earlier work combined with the results in

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Figure B offers a very long trend in teacher wages—as the wage gap for females moved from a substantial wage premium to a large wage penalty.

Referring to Figure B, female teachers earned wages comparable to those of other college graduates in the mid-1990s. By 2000, however, female teachers were earning 5.7 percent less than comparable workers, and by 2008 were earning 9.7 percent less. Wages for female teachers fared somewhat better in the early part of the recession, but beginning in 2011 the wage penalty for women increased annually until it reached its largest deficit of 13.9 percent in 2015.

The teacher wage gap has always been largest for male teachers—it was -22.1 percent in 1979 and grew to -24.5 percent in 2015. The larger male teacher wage gap reflects that teaching has been a predominantly female profession. Consequently—because of gender discrimination and more limited options—wages have been less than those of male-dominated professions. Men in predominantly female professions will thus earn substantially less than men in male-dominated professions. The gap lessened from 1990 to 1996, but increased quickly during the late 1990s, when wages of college graduates increased considerably and teachers' wages stagnated. The large wage penalty that male teachers face goes a long way toward explaining why the gender makeup of the teaching profession has not changed much over the past few decades (three-fourths of teachers are female).

Given this strong growth in the teacher wage penalty among women, and the large but mostly stable penalty among men, it is not surprising that the overall teacher wage penalty also reached a historic high in 2015: 17.0 percent. The overall teacher wage penalty was modest in the mid-1990s, at roughly 4 percent, but grew to 10.2 percent in 2000 and grew further to 13.8 percent in 2008 before edging up to its historically high level in 2015.

Results by age cohorts

As suggested, the erosion in relative teacher wages documented in Figure A has consequences for teacher quality through its effects on recruitment and retention. The wages provided to younger teachers will have the most effect on teacher recruitment, so it is important to examine wage trends by age cohort. Therefore, we examine relative teacher wages by age using three age cohorts: "young" (age 25–34), "middle" (age 35–44), and "senior" (age 45–54). We examine 1996 to 2015 since, as explained in Appendix A, this period is not affected by significant coding changes or imputation issues and is unaffected by the 1994 CPS redesign.

We start by analyzing all teachers and then look more closely at female teachers, given that they comprise most of the teaching profession.[11] **Figure C** reveals that the teacher wage penalty, for all three cohorts, worsened from 1996 to 2001—again, during the tight labor markets that especially benefited other college graduates. The picture is a bit mixed thereafter. For young teachers, post-2001 the wage gap lessened slightly until 2011 and then grew until reaching -16.4 percent in 2015, returning to its 2002 level.

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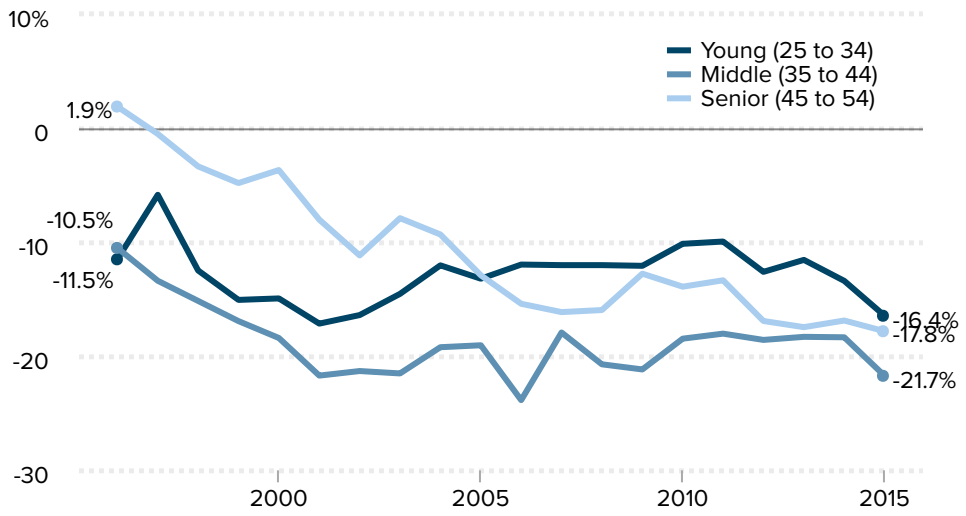
Figure C

The teacher wage gap grew more for experienced teachers

Wage gap between public school teachers and similar workers, by age cohort, 1996–2015



Note: Figure compares weekly wages. Regression-adjusted estimates include controls for age (quartic), education, race/ethnicity, geographical region, marital status, and gender for the pooled sample. Data are for workers age 18–64 with positive wages (excluding self-employed workers).

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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The post-2001 wage gap for the middle group of teachers has been somewhat flat, but over the entire 1996–2015 period the gap doubled from -10.5 percent to -21.7 percent. The erosion of relative teacher wages has fallen most heavily on experienced teachers. Year after year, the most experienced teacher cohort has undergone a prolonged deterioration in relative wages throughout the entirety of our analysis. In 1996, senior teachers had a wage *premium* of 1.9 percent. The senior gap generally increased without any of the sustained periods of modest improvement the other two cohorts experienced. By 2015 the senior teacher wage gap had grown to -17.8 percent—which is between the gaps of the other two cohorts.

The results from our age cohort analysis on females are presented in **Figure D**. Generally, the pattern and trends are qualitatively analogous to those reported for teachers overall (Figure C)—which is expected given that most teachers are female. But because the male teacher wage gaps are significantly more negative than those for female teachers, the results for female teachers alone are less negative than overall.

Again, from 1996 to 2015, the wage gaps have grown more negative for each of the three cohorts, and the gaps have converged over time. For the younger cohort, the wage penalty increased from 9.3 percent to 14.0 percent over our timeframe. The penalty of the middle cohort increased 10 percentage points, from 9.1 percent to 19.1 percent. And the largest erosion of relative teacher wages occurred for female, senior teachers—some of

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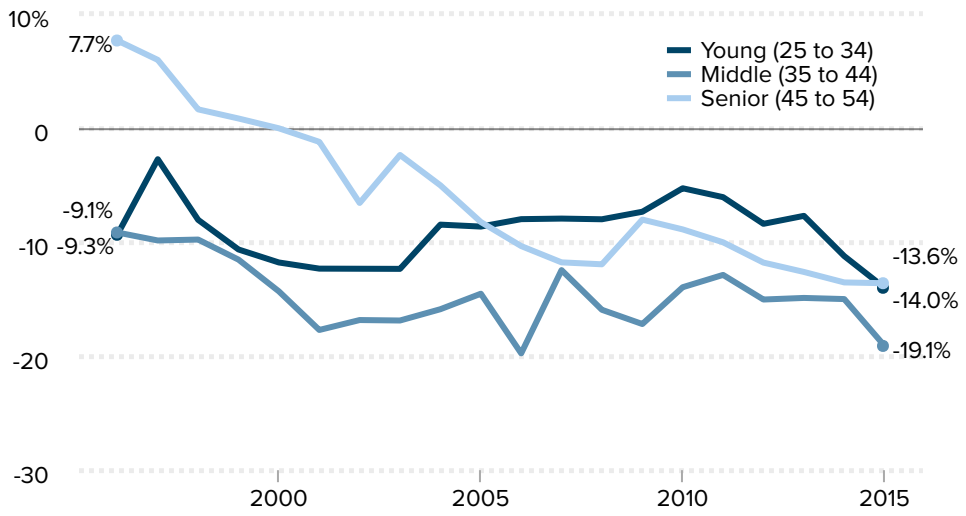
Figure D

Regardless of experience, teacher wage gap expanded for female teachers

Wage gap between female public school teachers and similar female workers, by age cohort, 1996–2015



Note: Figure compares weekly wages. Regression-adjusted estimates include controls for age (quartic), education, race/ethnicity, geographical region, marital status, and gender for the pooled sample. Data are for workers age 18–64 with positive wages (excluding self-employed workers).

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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the most experienced in the profession. This group experienced a 7.7 percent wage *premium* in 1996 that became a wage penalty of 13.6 percent in 2015.

These estimates establish that in 2015 there was a sizable and comparable teacher wage penalty ranging from 15 to 20 percent at all levels of experience, from entry-level to experienced workers. The teacher wage penalty grew the most among experienced teachers. This pattern suggests that, compared with 20 years ago, recruitment is becoming more difficult, and so is the retention of experienced and very experienced teachers.

Results by union status

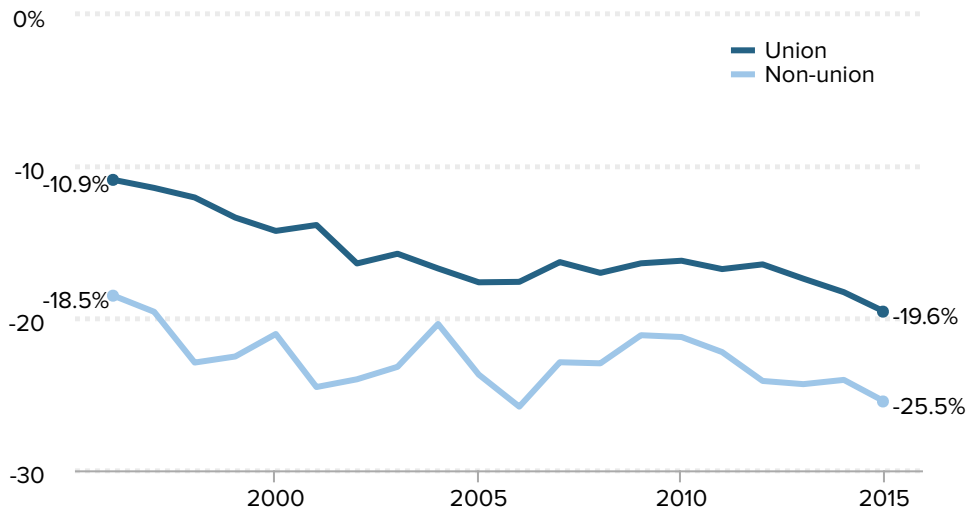
Given the large and growing teacher wage penalty, it is informative to know how collective bargaining affects teachers' wages. Union density of teachers is much higher than in the general workforce. In our sample, 72 percent of public school teachers are either union members or covered by a union contract. This compares with just 13 percent of non-teacher workers in our analysis. In general, union density has been on the decline in the United States. This section examines the level and trend of the teacher wage gap among those covered and not covered by collective bargaining.

visited on 12/6/2017

Figure E

Teachers in a union have a smaller wage gap

Wage gap between public school teachers and similar workers, by union status, 1996–2015



Note: Figure compares weekly wages. Regression-adjusted estimates include controls for age (quartic), education, race/ethnicity, geographical region, marital status, and gender for the pooled sample. Data are for workers age 18–64 with positive wages (excluding self-employed workers). Union representation is defined as being a union member or being covered by a union contract.

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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Here we run the same regression analysis as explained above but we include an additional control for collective bargaining coverage. A dichotomous collective bargaining indicator is defined in the affirmative if a worker is either a member of a union or covered by a union contract, as opposed to not being affiliated with a union. The collective bargaining variable is then interacted with the indicator variable on public teachers. In this way we estimate wage gaps separately for teachers who collectively bargain for their wages and teachers who are not covered by collective bargaining—both groups again compared with other similar college graduates.

Focusing our analysis on 1996–2015, **Figure E** shows that teachers not covered by collective bargaining faced a larger wage penalty than teachers who benefit from collective bargaining. Teachers without collective bargaining had a teacher wage penalty 7.0 percentage points greater than teachers with collective bargaining, on average, from 1996 through 2015. Both groups of teachers, however, faced a substantial and growing teacher wage penalty over the last two decades. In 1996, the wage gap for union teachers was -10.9 percent, compared with -18.5 percent for non-union teachers. The difference between the teacher wage gaps for unionized versus non-unionized teachers has narrowed slightly over time—the gaps grew to -19.6 percent (union teachers) and -25.5 percent (non-union teachers) in 2015.

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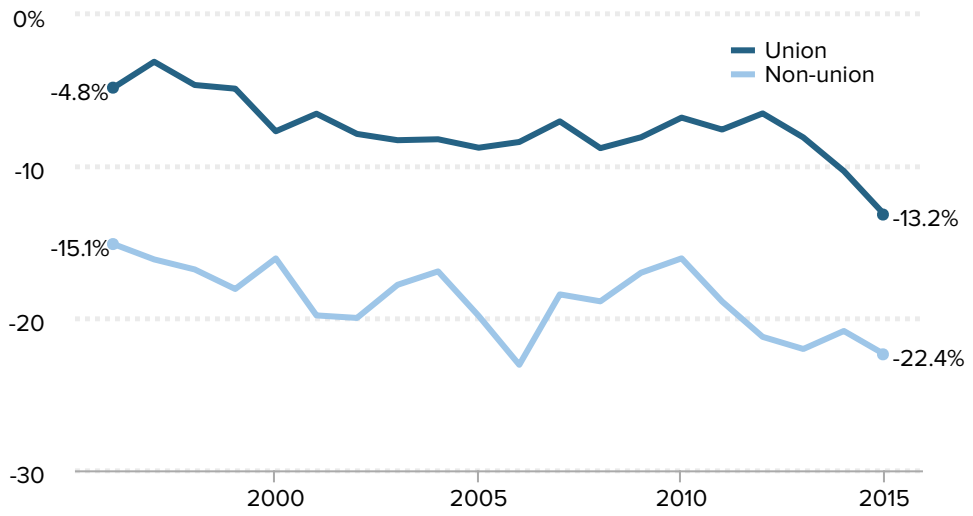
Figure F

The wage gap is smaller for female teachers in a union

Wage gap between female public school teachers and similar female workers, by union status, 1996–2015



Note: Figure compares weekly wages. Regression-adjusted estimates include controls for age (quartic), education, race/ethnicity, geographical region, marital status, and gender for the pooled sample. Data are for workers age 18–64 with positive wages (excluding self-employed workers). Union representation is defined as being a union member or being covered by a union contract.

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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Figure F shows that the mitigating effect of collective bargaining on relative teacher wages is larger for female teachers compared with all teachers. Over 1996–2015, the wage penalty of female teachers with collective bargaining was 7.5 percent, less than half the 18.8 percent wage penalty experienced by female teachers lacking collective bargaining. This means collective bargaining reduced the wage penalty for female teachers by 11.3 percentage points. In 1996, the wage gaps were -4.8 percent and -15.1 percent for union and non-union female teachers, respectively. The wage gaps, while growing more negative over time, sharply declined in the latter years, with the sharp decline beginning in 2010 for non-union teachers and after 2012 for union teachers. The wage gap for union-affiliated female teachers doubled from -6.5 percent in 2012 to -13.2 percent in 2015. The gap increased by 6.3 percentage points for non-union teachers from 2010 (-16.1 percent) to 2015 (-22.4 percent).

State wage analysis: Ratios overall and by state

To this point our analysis has focused on average teacher wage gaps for the United States, but there are differences across states. The data employed here do not allow for a robust regression analysis for each state, but simple within-state ratios of public school

visited on 12/6/2017

teachers to other college graduates are informative. We used pooled 2011–2015 CPS-ORG data to calculate state wage ratios shown in **Figure G**.[12] The ratio for the overall United States is 0.77, meaning that, on average, teachers earn just 77 percent of what other college graduates earn in wages. Arizona (0.63) has the lowest ratio, while Wyoming (0.99) has the highest. In 18 states, public school teacher weekly wages lag by more than 25 percent. In contrast, there are only five states where teacher weekly wages are less than 10 percent behind, and no state where teacher wages are equal to or better than those of other college graduates. **Appendix C** lists state ratios and reports weekly wages for teachers and other college graduates by bachelor and master degree.

Adding benefits to the picture

Our analysis of relative teacher pay thus far has focused entirely on the wages of teachers compared to other workers. Yet benefits such as pensions and health insurance are an increasingly important component of the total compensation package. Teachers do enjoy more attractive benefit packages than other professionals; thus, our measure of relative teacher wages overstates the teacher disadvantage in total compensation. The different natures of wages and benefits should be kept in mind, as it is only wages that may be spent or saved. Thus, the growing wage penalty is always of importance.

This section examines how our estimates of relative teacher wages should be adjusted to reflect differences in total compensation; that is, it measures the size of the advantage teachers have in benefits, relative to other professionals, and adjusts the wage penalty to derive an overall compensation penalty. We draw heavily on our prior work analyzing the "benefits bias" (Allegretto, Corcoran, and Mishel 2004, 2008) and update our calculations to 2015.

Basic facts on non-wage benefits and the "benefits bias"

Table 1 provides the basic information necessary to compare benefits packages—as a share of overall compensation—of primary, secondary, and special education teachers and comparable workers (specifically, professional workers).[13] This table uses the BLS Employer Costs for Employee Compensation (ECEC) series to disaggregate the overall cost of compensation into its various components, such as wages, benefits, and employer taxes. These shares allow us to estimate the benefits advantage not taken into consideration in the wage-only comparisons presented earlier. This section presents estimates of the benefits advantage for 1994–2015 to enable estimates of the overall teacher compensation (wages and benefits) penalty.

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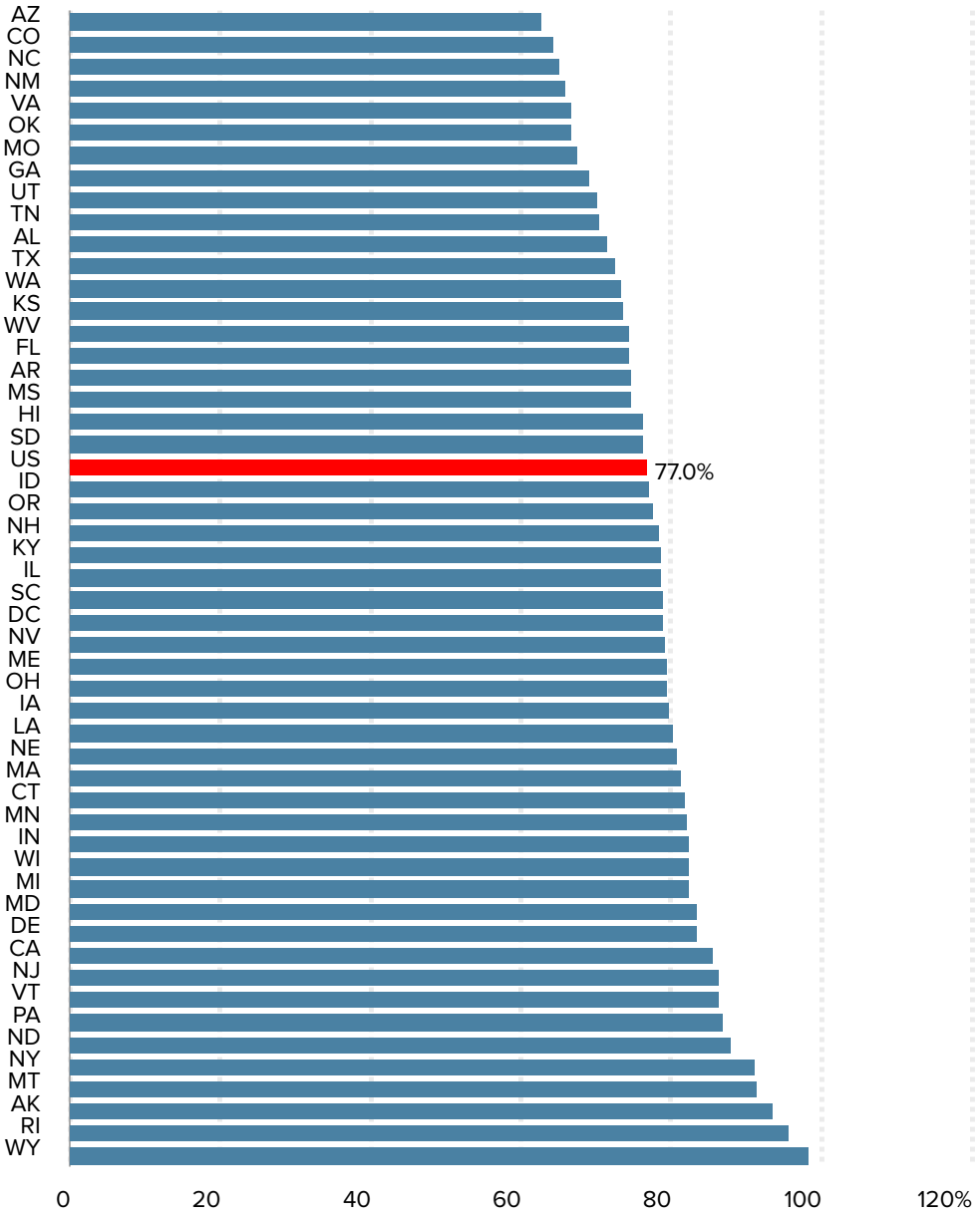
Figure G

In no state are teachers paid more than other college graduates

Ratios of public school teacher wages to wages of other college graduates, by state



Note: Figure compares weekly wages. State totals are weighted averages of the B.A.- and M.A.-level weekly wages where the weights are the shares of teachers with a B.A. or M.A. This ensures that the distribution of education among teachers and other college graduates does not affect the comparison. Data are for workers age 18–64 with bachelor's or master's degrees and positive wages (excluding self-employed workers).

Source: Authors' analysis of pooled 2011–2015 Current Population Survey Outgoing Rotation Group data

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Table 1

Wages and benefits of public school teachers versus other professionals, 2015

	Share of compensation (%)	
	Professionals	Teachers
Wages		
Direct wages	69	68.8
Paid leave	7.4	4.4
Supplemental pay	2	0.3
Total W-2 wages	78.4	73.4
Benefits		
Insurance	8.7	11.2
Pension	6.4	10.5
Payroll taxes	6.4	5
Total non-wage benefits*	21.6	26.6
Total compensation	100	100
Memo: Pension and payroll taxes	12.8	15.5

* Includes some "other" benefits.

Source: Authors' analysis of Bureau of Labor Statistics Employer Costs for Employee Compensation data

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Table 1 divides total compensation into several categories, including wages, benefits, and payroll taxes. (Although workers do not perceive payroll taxes as “compensation,” they do represent a part of an employer’s labor costs; hence, they should affect the overall compensation package a worker receives.) Wages, in turn, are divided into two components. The first is “direct wages,” defined by the BLS as “regular payments from the employer to the employee as compensation for straight-time hourly work, or for any salaried work performed.” This definition of wages is what the ECEC refers to as wages. “Direct wages” exclude the second component—“other wages”—which includes “supplemental pay” (including premium pay for overtime, bonus pay, and profit-sharing) and “paid leave.” The sum of basic and other wages is identified as “W-2 wages,” a wage measure that corresponds to the wages captured in the CPS data used above and is the wage reported to employees and to the Internal Revenue Service. It is important to note that one will obtain a different teacher wage differential depending on which wage measure is employed. This follows from the fact that “other wages” are a larger part of compensation for other professionals (9.4 percent in 2015) than for teachers (4.7 percent), as teachers rarely receive bonuses or paid vacation (although they may receive additional wages for extracurricular activities). Consequently, analysis of direct wages alone will tend to understate the teacher wage differential disadvantage by 5 percentage points relative to an analysis of total (W-2) wages.

Table 1 also presents the shares of the two main non-wage (or fringe benefit) components of compensation—insurance and pension benefits—as well as payroll taxes (i.e., Social Security, unemployment insurance, and workers’ compensation). Teachers have a greater share of their compensation in insurance (which is nearly entirely health insurance) and pension benefits, comprising 21.7 percent of overall teacher compensation, versus 15.1 percent of professional compensation. One reason health and pension costs are higher for

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Table 2

Trends in the teacher compensation penalty, 1994–2015

	Compensation to W-2 wage ratio		Teacher wage penalty, benefit advantage, and compensation penalty		
	Professionals	Teachers	Wage penalty	Benefit advantage*	Compensation penalty
1994	n.a.	n.a.	-1.8%	1.7%	-0.1%
2004	1.23	1.26	-11.4%	1.8%	-9.6%
2007	1.24	1.29	-13.0%	3.3%	-9.7%
2012	1.26	1.34	-14.1%	5.1%	-9.0%
2015	1.28	1.36	-17.0%	5.9%	-11.1%
Percentage-point change					
1994–2004	n.a.	n.a.	-9.6	0.0	-9.6
2004–2007	1.0	3.1	-1.6	1.5	-0.1
2007–2012	2.3	5.1	-1.1	1.8	0.7
2012–2015	1.2	2.5	-2.9	0.8	-2.1
2004–2015	4.5	10.7	-5.6	4.1	-1.5
1994–2015	n.a.	n.a.	-15.2	4.2	-11.0

* The benefit "bias," or the degree to which higher benefits offset the wage penalty.
** Because of discontinuities in occupational categories for both teachers and professionals, 1994 data are not comparable. See Allegretto, Corcoran, and Mishel (2008, Chapter 4).

Source: Author's analysis of Current Population Survey Outgoing Rotation Group data and Bureau of Labor Statistics Employer Costs for Employee Compensation data

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teachers is that teacher health benefits are provided for a full year for workers who receive salaries for less than a full year. These greater costs would also reflect teachers having better benefit packages.

Note that payroll taxes, on average, are also less for teachers nationwide, the result of some teachers not being in the Social Security system. This is an important observation, as recent claims of "excessive" teacher pension costs (e.g., Roza 2007 and Tucker 2007) do not take into account the fact that some teachers have lower payroll taxes because they are not in the Social Security system and will not earn Social Security benefits based on their work as a teacher. Pension plans where participants are not also covered by Social Security will necessarily have higher pension costs. This is why pension costs should not be considered without also examining Social Security at the same time.

The "memo" line at the bottom of Table 1 shows that combined pension and payroll tax costs as a share of overall compensation for teachers exceeds that for professionals but to a lesser degree than looking at retirement benefits alone. Non-wage compensation as a whole was more important for teachers (26.6 percent) than for professionals (21.6 percent).

Table 2 uses the data in Table 1 (and comparable ECEC data for earlier years) to compute the "benefits bias" or the "benefits advantage." This estimate tells us to what extent an estimated relative wage disadvantage will be offset by a relative benefits advantage. Table 2 updates the analysis presented in Allegretto, Corcoran, and Mishel (2008).

The analysis is presented for several years between 1994 and 2015 so that we can identify the changes in both the benefits advantage and the wage penalty to derive the overall compensation disadvantage faced by primary and secondary school teachers. We rely on

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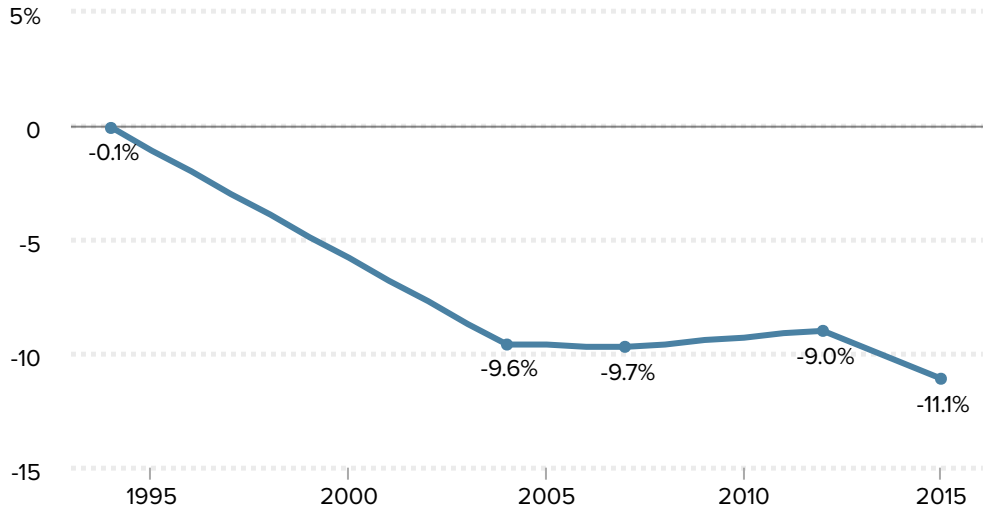
Figure H

The teacher compensation penalty has grown to 11 percent

Compensation gap between public school teachers and similar workers, 1994–2015



Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data and Bureau of Labor Statistics Employer Costs for Employee Compensation data

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the analysis presented in Allegretto, Corcoran, and Mishel (2008) for the trends from 1994 to 2004 and update them to 2015. The first step is to use the ECEC series to compute the ratio of overall compensation to W-2 wages. We benchmark teacher compensation trends to those of professionals so that the benefits advantage of teachers captures the degree to which their benefits exceed those of other professionals. As Table 2 shows, compensation exceeds wages more among teachers than professionals (36.2 percent versus 27.5 percent in 2015) and more so now than in earlier years. That means primary and secondary school teachers have a benefits advantage that somewhat offsets the wage disadvantages they face. The total teacher compensation penalty was a record-high 11.1 percent in 2015, as depicted in **Figure H** (composed of a 17.0 percent wage penalty plus a 5.9 percent benefit advantage).

We estimate that in 1994 there was essentially no compensation penalty for teachers, as the 1.8 percent wage penalty was fully offset by a benefits advantage. The wage penalty grew substantially since 1994, as noted above, rising 15.2 percentage points by 2015 (bottom row of Table 2). However, the 4.2 percentage-point increase in the benefits advantage partially offset the wage trends so that the overall compensation penalty grew by 11.0 percentage points.[14] The compensation penalty actually subsided a bit in the early part of the Great Recession and recovery, from 2007 to 2012, as the increase in the wage penalty by 1.1 percentage point was more than offset by the increased benefits advantage of 1.8 percentage points. Between 2012 and 2015, however, the faster growth in the wage penalty, 2.9 percentage points, was only slightly offset by a growing benefits advantage.

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These trends in wages and benefits are probably related. Recent years have seen extreme pressure on school district budgets to curtail hiring and costs. It may be the case that teachers and school districts have sought to preserve benefits by restraining wage costs. If this were the case relative to the employers of professionals we would observe a greater teacher wage penalty with a partially offsetting increased benefits advantage. The bottom line is that since 1994 there has been an erosion of teacher compensation of 11 percentage points relative to other college graduates and professionals.

Conclusion

The opportunity cost of becoming a teacher and remaining in the profession becomes more and more important as relative teacher pay falls further behind that of other professions. The large negative wage gap for male teachers likely is a key reason why the gender mix of teachers has not changed much over time. That women, once a somewhat captive labor pool for the teaching profession, have many more opportunities outside the profession today than in the past means that growing wage and compensation differentials will make it all the more difficult to recruit and retain high-quality teachers. Moreover, the ever-increasing costs of higher education and burdensome student loans are also a barrier to the teaching profession in light of a widening pay gap.

The recent trends we document represent only a small part of a much larger long-run decline in the relative pay of teachers. U.S. decennial Census data show that the wage gap between female public school teachers and comparably educated women—for whom the labor market dramatically changed over 1960–2000—grew by nearly 28 percentage points, from a relative wage advantage of 14.7 percent in 1960 to a disadvantage of 13.2 percent in 2000. Among all (male and female) public school teachers, the relative wage disadvantage grew almost 20 percentage points over 1960–2000 (Allegretto, Corcoran, and Mishel 2008, 7). Our results show that the teacher wage penalty grew an additional 7.0 and 9.6 percentage points, respectively, for all and female teachers since 2000.[15]

Improvements in the non-wage benefits of primary and secondary school teachers partially offset the worsening wage disparities: The weekly total compensation (wages plus benefits) disadvantage facing teachers in 2015 was about 11 percent, or roughly 6 percentage points less than the 17 percent weekly wage disadvantage estimated for that year. It is good news that teachers are able to bargain a total compensation package—as it seems they may have forgone wage increases for benefits recently. But, as we've documented, teacher wages have been stagnant since the mid-1990s. This makes the wage gap, on its own, critically important, as it is only earnings that help to make ends meet regarding pecuniary expenses such as rents, food, and paying off student loans.

If the policy goal is to improve the quality of the entire teaching workforce, then raising the level of teacher compensation, including wages, is critical to recruiting and retaining higher-quality teachers. Policies that solely focus on changing the composition of current compensation (e.g., merit or pay-for-performance schemes) without actually increasing compensation levels are unlikely to be effective. Simply put, improving overall teacher quality requires correcting the teacher compensation disadvantage.

visited on 12/6/2017

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Appendix A

In this appendix we provide a summary of the data used in this analysis. Further documentation of each can be found in Allegretto, Corcoran, and Mishel (2008).

We use individual data from the Current Population Survey (CPS) from the Bureau of Labor Statistics (BLS), specifically the "Outgoing Rotation Group" sample, or CPS-ORG. The teachers studied here are elementary, middle, and secondary school teachers (teachers not included are kindergarten, early-education, and special education teachers). The CPS is the monthly survey administered by the BLS to more than 60,000 households to measure and report on unemployment. The CPS-ORG data used here are based on reports from nearly 145,000 workers each year. The CPS-ORG is one of the data sources most widely used by economists to study wages and employment. The CPS-ORG data are particularly useful due to their large sample and information on weekly wages. Since 1994, the CPS-ORG survey has asked respondents to report their wages on a weekly, biweekly, monthly, or annual basis (whichever the respondent finds most appropriate), from which the BLS then derives the weekly wage. More than half of teachers report an annual (as opposed to a monthly, bi-weekly, or weekly) wage to BLS. Respondents also report the hours they worked the previous week.

This analysis restricts the sample to all full-time workers between the age of 18 and 64 (defining "full time" as working at least 35 hours per week). Teachers are identified using detailed Census occupation codes, and include only elementary and secondary teachers

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(pre-kindergarten and kindergarten teachers, adult educators, and special education teachers are excluded). This analysis also only focuses on public school teachers (private school teachers—who on average earn less than public school teachers—are excluded).[16]

There are several measurement issues that require some further discussion. First, as in our earlier work, we limit our analysis to workers whose wage data were provided by the respondent and not "imputed," or assigned by the Census Bureau, who imputes earnings for the BLS. Second, we justify our choice of comparing weekly, as opposed to annual or hourly, earnings. Lastly, several coding changes over the period under study are worth noting.

Imputations

The CPS-ORG data used in this analysis are non-imputed data. When a survey respondent fails to report any earnings, the BLS imputes his or her earnings. The imputation procedure is based on a Census Bureau "hot deck" methodology that finds a respondent or "donor" in the survey who closely matches the non-respondent in characteristics such as location, age, race, and education. The problem arises here because occupation is not necessarily one of the criteria used in imputing earnings—non-responding teachers are more often than not assigned the average earnings of non-teacher college graduates. Given differences in the earnings and work year of teachers and non-teachers, this procedure creates a systemic bias in the comparison of teacher earnings with that of other professionals, as imputed teacher earnings are systemically overstated.[17]

In addition, the share of CPS earnings data that are imputed has grown markedly over time; hence, the bias has worsened. In 1979, imputed earnings data in the CPS were 17 percent; by 2000 imputations accounted for 33 percent of the sample, and in 2015 they made up 41 percent of the sample. The implications for our analysis of the teacher wage gap are significant. In the early years, 1979 through 1993, the teacher wage gap differential between using all the data available (without regard for imputations) and analyzing only non-imputed observations was *at most* a 2 percentage-point difference—meaning that the inclusion of imputed data *lessened* the teacher wage gap by 2 percentage points or less. But, post 1996 the gap steadily grew, and in 2015 the differential is larger than ever. For all teachers, the teacher pay gap of 17 percent reported in Figure B (estimated without imputed data) would be mitigated to a 10 percent gap had imputations been included. The bias in closing the gap is 6 and 9 percentage points for female and male teachers, respectively.

Imputed data are not available in 1994 and only for the last four months of 1995. Thus, we extrapolate results for these two years by comparing output from using all the data available to output from using non-imputed data only. We do this comparison for the years just prior to and just after 1994 and 1995. Comparing the results gives us a reasonable rough estimate of what may be expected if non-imputed data were available for 1994 and 1995.

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Weekly wage

This analysis of the relative wage of teachers relies on comparisons of weekly earnings, rather than annual or hourly earnings, the approach taken by some authors (e.g., Hanushek and Rivkin 1997; Greene and Winters 2007). As discussed in our prior work, we elect to use weekly wages to avoid measurement issues regarding differences in annual weeks worked (teachers' traditional "summers off") and the number of hours worked per week that arise in many studies of teacher pay. It is often noted that the annual earnings of teachers cannot be directly compared with those of non-teachers, given that teachers are typically only contracted to work a nine-month year. But differences arise over exactly how much time teachers devote to their position outside of their nine contracted months of teaching. Teachers spend some of their summer months in class preparation, professional development, or other activities expected of a professional teacher. Teachers who may wish to earn additional income during the summer months can often do so, but are unlikely to be able to earn at the same rate of pay as in their teaching role. Similarly, attempts to compare the hourly pay of teachers and other professionals have resulted in considerable controversy by setting off an unproductive debate about the number of hours teachers work at home versus other professionals.[18] Such decisions regarding pay interval (weekly, annual, or hourly) become mostly irrelevant when considering changes in relative pay over time.

Changes in relative wages can be expected to be similar as long as the relative work time (between teachers and comparable professionals) remains constant. For example, if the ratio of weekly hours worked by teachers relative to those worked by comparable workers remains constant over time, then estimates of changes in hourly wages will be the same as for weekly changes. Similarly, estimated changes in relative annual earnings will parallel those for weekly earnings as long as the annual weeks and hours worked by teachers have not changed relative to those of comparable workers.

Some researchers (e.g., Podgursky and Tongrut 2006) have contended that the use of the CPS-ORG data downwardly biases teacher earnings. This issue is particularly relevant to CPS data prior to the 1994 CPS redesign (more on this below). In Allegretto, Corcoran, and Mishel (2008) we benchmarked the CPS-ORG data to annual data from the March CPS. This extensive benchmarking exercise provided validation that the CPS-ORG data are consistent with annual March data, which Hanushek and Rivkin (1997, 2004), Temin (2002, 2003) and Podgursky and Tongrut (2006) have used in their analyses of teacher wage trends. As expected, the annual wage gap is just the weekly wage gap multiplied by the ratio of teacher and non-teacher annual weeks worked, with the caveat that we have more confidence in the post-redesign CPS data. Our benchmarking exercise leaves little doubt that there has been deterioration in the relative earnings of teachers over time. Moreover, our use of weekly wage comparisons in all of our work on teacher pay allows us to avoid unproductive discussions of work years, summers off, and so on. Allegretto, Corcoran, and Mishel (2008) also show in Chapter 2 that the long-term trends in the March CPS, decennial Census, and CPS-ORG data all yield similar findings regarding the relative erosion of teacher wages.

visited on 12/6/2017

CPS 1994 redesign

The CPS was redesigned in 1994. The change in the CPS survey question on earnings appears to have resulted in a significantly higher weekly wage among teachers, as teacher wages rose 10.2 percent between 1993 and 1994 (the year the redesigned survey was first used)—far faster than the 2.2 percent increase among non-teacher college graduates. The additional 8 percent wage growth among teachers appears to represent the effects of a correction for the underlying bias in the pre-1994 survey. Consequently, our estimates incorporate the pre-1994 data in a way that does not allow this bias to be built into our results.

A second issue concerns the coding schemes regarding education. Prior to 1992 the survey asked for the "highest grade of school attended," and in 1992 the question was changed to "highest level of school completed or the highest degree received." Thus, degrees are not known prior to 1992 even as a best guess crosswalk is used. For more information on CPS coding schemes and the 1994 redesign, see Cohany, Polivka, and Rothgeb (1994).

visited on 12/6/2017

Appendix B

Estimated public school teacher weekly wage penalty, 1979–2015

Year	All	Females	Males
1979	-5.6%	4.2%	-22.1%
1980	-8.5%	1.8%	-24.6%
1981	-8.5%	0.3%	-23.0%
1982	-8.2%	0.3%	-22.0%
1983	-9.6%	-1.4%	-22.7%
1984	-7.9%	-0.2%	-20.7%
1985	-7.6%	-0.2%	-20.7%
1986	-7.8%	0.0%	-20.7%
1987	-7.6%	-0.3%	-20.6%
1988	-7.0%	0.9%	-19.7%
1989	-9.1%	-1.3%	-22.4%
1990	-8.8%	-0.2%	-22.8%
1991	-9.5%	-2.5%	-20.8%
1992	-6.8%	0.5%	-19.6%
1993	-6.4%	-0.1%	-18.2%
*1994**	-1.8%	3.7%	-15.1%
*1995**	-4.0%	1.5%	-16.6%
1996	-4.3%	-0.7%	-15.1%
1997	-5.3%	-0.4%	-18.1%
1998	-8.4%	-2.5%	-21.8%
1999	-10.0%	-4.3%	-21.9%
2000	-10.2%	-5.7%	-21.7%
2001	-12.6%	-7.0%	-24.7%
2002	-13.5%	-8.6%	-24.8%
2003	-12.4%	-7.6%	-22.5%
2004	-11.4%	-6.9%	-22.0%
2005	-13.4%	-8.4%	-24.8%
2006	-15.1%	-10.5%	-25.5%
2007	-13.0%	-7.9%	-24.4%
2008	-13.8%	-9.7%	-23.8%
2009	-12.4%	-7.7%	-23.0%
2010	-12.1%	-6.6%	-23.3%
2011	-12.5%	-8.1%	-23.3%
2012	-14.1%	-9.9%	-23.7%
2013	-14.7%	-10.7%	-24.3%
2014	-15.3%	-12.0%	-23.4%
2015	-17.0%	-13.9%	-24.5%

Note: Imputed data are not available in 1994 and only for the last 4 months of 1995. Thus, we extrapolate results for these two years by comparing output from using all the data available to output from using non-imputed data only. We do this comparison for the years just prior to and just after 1994 and 1995. Comparing the results gives us a reasonable rough estimate of what may be expected if non-imputed data were available for 1994 and 1995. Data are for workers age 18–64 with positive wages (excluding self-employed workers).

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data

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Appendix C

Appendix C

Public school teacher and non-teacher college graduate weekly wages, by state

State	(1) Public elementary and secondary teachers			(2) Other college graduates			Ratio (1)/(2)		
	B.A. only	M.A. only	Total	B.A. only	M.A. only	Total*	B.A. only	M.A. only	Total
US	$948	$1,229	$1,100	$1,266	$1,566	$1,428	0.75	0.79	0.77
AK	$1,274	$1,405	$1,339	$1,305	$1,550	$1,427	0.98	0.91	0.94
AL	$787	$984	$905	$1,146	$1,337	$1,260	0.69	0.74	0.72
AR	$772	$935	$830	$1,035	$1,243	$1,109	0.75	0.75	0.75
AZ	$743	$953	$877	$1,234	$1,487	$1,395	0.60	0.64	0.63
CA	$1,271	$1,509	$1,386	$1,435	$1,808	$1,616	0.89	0.84	0.86
CO	$833	$1,029	$947	$1,286	$1,598	$1,467	0.65	0.64	0.65
CT	$1,052	$1,500	$1,432	$1,446	$1,798	$1,745	0.73	0.83	0.82
DC	$1,066	$1,379	$1,273	$1,399	$1,715	$1,608	0.76	0.81	0.79
DE	$1,088	$1,121	$1,108	$1,188	$1,411	$1,324	0.92	0.79	0.84
FL	$857	$999	$913	$1,122	$1,379	$1,223	0.76	0.72	0.75
GA	$831	$1,045	$944	$1,230	$1,482	$1,363	0.68	0.71	0.69
HI	$926	$1,042	$979	$1,161	$1,428	$1,281	0.80	0.73	0.76
IA	$850	$1,113	$962	$1,114	$1,322	$1,202	0.76	0.84	0.80
ID	$869	$1,037	$927	$1,101	$1,386	$1,199	0.79	0.75	0.77
IL	$866	$1,346	$1,174	$1,275	$1,604	$1,486	0.68	0.84	0.79
IN	$855	$1,147	$1,008	$1,117	$1,319	$1,223	0.77	0.87	0.83
KS	$821	$1,027	$928	$1,127	$1,375	$1,256	0.73	0.75	0.74
KY	$758	$1,029	$958	$1,111	$1,254	$1,217	0.68	0.82	0.79
LA	$920	$917	$919	$1,084	$1,246	$1,141	0.85	0.74	0.81
MA	$1,135	$1,388	$1,321	$1,413	$1,693	$1,619	0.80	0.82	0.82
MD	$1,198	$1,429	$1,342	$1,403	$1,729	$1,606	0.85	0.83	0.84
ME	$947	$1,034	$993	$1,088	$1,387	$1,245	0.87	0.75	0.80
MI	$930	$1,349	$1,215	$1,244	$1,575	$1,469	0.75	0.86	0.83
MN	$920	$1,329	$1,189	$1,280	$1,531	$1,445	0.72	0.87	0.82
MO	$748	$991	$895	$1,159	$1,426	$1,320	0.65	0.70	0.68
MS	$743	$878	$791	$999	$1,161	$1,057	0.74	0.76	0.75
MT	$833	$1,079	$943	$973	$1,098	$1,029	0.86	0.98	0.92
NC	$745	$978	$836	$1,163	$1,459	$1,278	0.64	0.67	0.65
ND	$879	$1,148	$968	$1,041	$1,211	$1,098	0.84	0.95	0.88
NE	$870	$1,104	$979	$1,091	$1,348	$1,210	0.80	0.82	0.81
NH	$1,044	$1,193	$1,136	$1,289	$1,544	$1,446	0.81	0.77	0.79
NJ	$1,291	$1,632	$1,460	$1,443	$1,936	$1,687	0.89	0.84	0.87
NM	$816	$936	$893	$1,132	$1,472	$1,349	0.72	0.64	0.66
NV	$899	$1,093	$1,025	$1,177	$1,352	$1,291	0.76	0.81	0.79
NY	$1,045	$1,488	$1,449	$1,343	$1,611	$1,588	0.78	0.92	0.91
OH	$848	$1,160	$1,057	$1,172	$1,401	$1,325	0.72	0.83	0.80
OK	$757	$803	$770	$1,084	$1,314	$1,149	0.70	0.61	0.67
OR	$1,066	$1,161	$1,140	$1,226	$1,531	$1,463	0.87	0.76	0.78
PA	$1,070	$1,313	$1,220	$1,241	$1,502	$1,401	0.86	0.88	0.87
RI	$1,213	$1,478	$1,356	$1,222	$1,582	$1,416	0.99	0.94	0.96
SC	$824	$975	$907	$1,070	$1,209	$1,146	0.77	0.81	0.79
SD	$717	$927	$789	$972	$1,149	$1,033	0.74	0.81	0.76
TN	$712	$956	$834	$1,050	$1,310	$1,180	0.68	0.73	0.71
TX	$954	$1,070	$983	$1,279	$1,562	$1,351	0.75	0.69	0.73
UT	$844	$1,078	$928	$1,213	$1,510	$1,319	0.70	0.71	0.70
VA	$981	$1,196	$1,096	$1,462	$1,792	$1,639	0.67	0.67	0.67
VT	$919	$1,157	$1,036	$1,068	$1,329	$1,196	0.86	0.87	0.87
WA	$1,063	$1,214	$1,175	$1,383	$1,673	$1,599	0.77	0.73	0.74
WI	$954	$1,192	$1,084	$1,217	$1,392	$1,313	0.78	0.86	0.83
WV	$780	$957	$884	$1,074	$1,263	$1,184	0.73	0.76	0.75
WY	$1,067	$1,276	$1,159	$1,113	$1,253	$1,175	0.96	1.02	0.99

* Totals are weighted averages of the B.A.- and M.A.-level weekly wages where the weights are the shares of teachers with a B.A. or M.A. This ensures that the distribution of education among teachers and other college graduates does not affect the comparison. Data are for workers age 18–64 with bachelor's or master's degrees and positive wages (excluding self-employed workers).

Source: Authors' analysis of pooled 2011–2015 Current Population Survey Outgoing Rotation Group data

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visited on 12/6/2017

Endnotes

1. We hear often that a strong teacher is the single biggest within-school factor influencing learning and student achievement, and both research and common sense affirm this. It is important to keep in mind, however, that teachers operate within a complex ecosystem of fellow teachers, school leadership, curriculum, standards, and a range of resources, including parent and community engagement, all of which have major impacts on teacher effectiveness. Indeed, as Anthony Bryk and his colleagues found in their research on school reforms in Chicago, school improvement—and thus increased achievement—is akin to baking a cake, with five essential ingredients that constantly interact (Bryk et al. 2010). So while it's critically important to design policies to strengthen the teacher corps, that effort must be complemented by larger work to improve school ecosystems as a whole.

2. The official Teacher Shortage Area list, which tracks open teacher positions across the United States, and by state since 1991, is available at http://www2.ed.gov/about/offices/list/ope/pol/tsa.html#list. In short, compared with the early 1990s, the list is growing (Strauss 2015). For many schools the start of the school year has the added stress and pressure to fill vacant teacher positions. At the last minute, many vacancies are filled with less-qualified teachers or administrators.

3. NEA survey found that 75 percent of teachers are satisfied with their jobs (Walker 2014). Despite the high level of overall satisfaction, nearly half (45 percent) of surveyed member teachers have considered quitting because of standardized testing. For insights into the trends in teacher satisfaction, see Richmond (2013), which presents data from the MetLife Survey of the American Teacher, conducted by Harris Interactive, which has been published annually since 1984 through 2012.

4. Gould (2015) estimates that due to the Great Recession and the ensuing austerity at all levels of government, public education jobs are still 236,000 fewer than they were seven years ago. The number of teachers rose by 41,700 over the last year. While this is clearly a positive sign, adding in the number of public education jobs that should have been created just to keep up with enrollment, we are currently experiencing a 410,000 job shortfall in public education.

5. See Darling-Hammond et al. (2016)

6. See Allegretto, Corcoran, and Mishel (2011).

7. To find out more about public versus private school teachers, see an in-depth paper by Allegretto and Tojerow (2014).

8. In Allegretto, Corcoran, and Mishel (2008), we compared the relative hourly pay of teachers using CPS data on hourly wages and found no qualitative differences in our results.

9. In Appendix A in Allegretto, Corcoran, and Mishel (2008), we benchmarked CPS-ORG weekly wages to annual wages in the March CPS and found the two measures to be consistent.

10. Recall that the dotted lines are guesstimates, and CPS underwent a major redesign in 1994.

11. Additionally, the smaller sample size of male teachers makes it hard to break out the sample further by age groups and get precise estimates; however, the general pattern matches that of overall teachers (although the negative pay gaps are more negative for male teachers, as depicted in Figure A).

visited on 12/6/2017

12. State totals are weighted averages of the B.A.- and M.A.-level weekly wages where the weights are the shares of teachers with a B.A. or M.A. This ensures that the distribution of education among teachers and other college graduates does not affect the comparison.

13. The ECEC provides compensation data for primary and secondary school teachers and for a broader category of "teachers." We analyze the narrower category, which matches closely our definition of teachers in our ORG data, except that the ECEC includes private school and special education teachers.

14. As reviewed in Allegretto, Corcoran, Mishel (2008), there are discontinuities in the occupational codes in the ECEC series for both teachers and professionals. The data for teachers in 1994–2003 is for all teachers, not just primary and secondary school teachers, and the definition of professionals differs from the data starting in 2004. We use the changes in 1994–2003 and add them to the 2004–2015 period to obtain the long-term change in the benefits advantage. This implicitly assumes no change over 2003–2004. That is, the benefit bias grew by 0.1 percentage points from 1994 to 2003 for teachers overall (K–12, university, and others). We assume that was the change among primary and secondary school teachers and therefore subtract 0.1 percent from the benefit advantage in 2004 to obtain our estimate of the 1994 benefits advantage.

15. As measured from 1999 to 2015 to reflect the 2000 Census data measuring 1999 wages.

16. To find out more about public versus private teachers, see Allegretto and Tojerow (2014).

17. For more on imputations see Allegretto, Corcoran, and Mishel (2008, 10).

18. In Allegretto, Corcoran, and Mishel (2008) we compared the relative hourly pay of teachers using CPS data on hourly wages and found no qualitative differences in our results.

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