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ASSESSING THE COMPENSATION OF  
PUBLIC-SCHOOL TEACHERS

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# ASSESSING THE COMPENSATION OF PUBLIC-SCHOOL TEACHERS

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The teaching profession is crucial to America's society and economy, but public-school teachers should receive compensation that is neither higher nor lower than market rates. Do teachers currently receive the proper level of compensation? Standard analytical approaches to this question compare teacher salaries to the salaries of similarly educated and experienced private-sector workers, and then add the value of employer contributions toward fringe benefits. These simple comparisons would indicate that public-school teachers are undercompensated. However, comparing teachers to non-teachers presents special challenges not accounted for in the existing literature.

First, formal educational attainment, such as a degree acquired or years of education completed, is not a good proxy for the earnings potential of school teachers. Public-school teachers earn less in wages on average than non-teachers with the same level of education, but teacher skills generally lag behind those of other workers with similar "paper" qualifications. We show that:

- The wage gap between teachers and non-teachers disappears when both groups are matched on an objective measure of cognitive ability rather than on years of education.
- Public-school teachers earn higher wages than private-school teachers, even when the comparison is limited to secular schools with standard curriculums.
- Workers who switch from non-teaching jobs to teaching jobs receive a wage *increase* of roughly 9

percent. Teachers who change to non-teaching jobs, on the other hand, see their wages *decrease* by roughly 3 percent. This is the opposite of what one would expect if teachers were underpaid.

Second, several of the most generous fringe benefits for public-school teachers often go unrecognized:

- Pension programs for public-school teachers are significantly more generous than the typical private-sector retirement plan, but this generosity is hidden by public-sector accounting practices that allow lower employer contributions than a private-sector plan promising the same retirement benefits.
- Most teachers accrue generous retiree health benefits as they work, but retiree health care is excluded from Bureau of Labor Statistics benefits data and thus frequently overlooked. While rarely offered in the private sector, retiree health coverage for teachers is worth roughly an additional 10 percent of wages.
- Job security for teachers is considerably greater than in comparable professions. Using a model to calculate the welfare value of job security, we find that job security for typical teachers is worth about an extra 1 percent of wages, rising to 8.6 percent when considering that extra job security protects a premium paid in terms of salaries and benefits.

We conclude that public-school teacher salaries are comparable to those paid to similarly skilled private-sector workers, but that more generous fringe benefits for public-school teachers, including greater job secu-

rity, make total compensation 52 percent greater than fair market levels, equivalent to more than \$120 billion overcharged to taxpayers each year. Teacher compensation could therefore be reduced with only minor effects on recruitment and retention. Alternatively, teachers who are more effective at raising student achievement might be hired at comparable cost.

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The compensation of public-school teachers is a perennial issue in American public policy, as the need to balance budgets collides with the desire to recruit and retain quality teachers. Since the operation of public schools is typically the largest local government expenditure, decisions about education funding often dominate local elections. Teachers' unions or professional associations operate in all 50 states, and they support local candidates who do political battle with opponents concerned about rising property taxes. In 13 states, teachers are allowed to strike to secure a more favorable contract—an option unavailable to police and firefighters—which raises the political stakes considerably.<sup>1</sup>

Pensions and other teacher benefits are often funded at the state level, leading to periodic clashes between teachers' unions and state governments over budget priorities. The recent recession has reduced tax receipts and forced states to make painful decisions about spending cuts or tax increases, further amplifying these conflicts.

One of the more prominent battles over teacher compensation has occurred in New Jersey, where Governor Chris Christie has required teachers and other public

workers to increase their health care contribution from 0 percent to 1.5 percent of salary.<sup>2</sup> Reforms proposed by Wisconsin Governor Scott Walker, which led to Democratic lawmakers fleeing the state to deny the legislature a quorum, reduced teachers' benefits and limited their ability to bargain collectively. Florida recently required state employees to contribute 3 percent of their salary to their pension plan, which had been funded exclusively by taxpayers. Florida teachers filed a lawsuit in response.<sup>3</sup>

Much of the debate over teacher compensation is couched as a question about how much the government can afford at the present time—that is, how much is it *able* to pay teachers? Reformers argue that reductions in wages and benefits for teachers are a budgetary necessity, while teachers argue that savings should be found elsewhere. But a different question is often ignored in the education debate, one that is independent of any government's current fiscal situation: How much *should* teachers be paid?

No one doubts the significance of high-quality teachers to the school system and to the economy in general, but even the most important public workers should

1. Allegheny Institute for Public Policy, "Teacher Strikes in Pennsylvania," January 2011, at <http://www.alleghenyinstitute.org/education/teacherstrikes.html> (September 29, 2011).
2. Chris Megerian, "N.J. Police, Firefighter Unions Sue to Stop Pension Reform Laws," NJ.com, April 23, 2010, at [http://www.nj.com/news/index.ssf/2010/04/nj\\_police\\_firefighter\\_unions\\_s.html](http://www.nj.com/news/index.ssf/2010/04/nj_police_firefighter_unions_s.html) (September 24, 2011).
3. Tami Luhby, "Florida Teachers Sue State in Pension Dispute," CNN.com, June 20, 2011, at [http://money.cnn.com/2011/06/20/news/economy/florida\\_teachers\\_pension\\_lawsuit/index.htm?iid=Lead](http://money.cnn.com/2011/06/20/news/economy/florida_teachers_pension_lawsuit/index.htm?iid=Lead) (September 24, 2011).

be paid at a level commensurate with their skills—no more, no less. Ideally, if a teacher’s skills are worth \$X in the private marketplace, that teacher should be paid \$X by the government. This system would ensure that the public gets qualified and competent teachers without overpaying for the privilege. How close is the United States to that ideal? There is much dispute about how to measure teachers’ skills and the total compensation they receive for them.

This report is a comprehensive assessment of salaries, benefits, and job security for public-school teachers, intended to resolve disputes over whether teachers as a group are “overpaid” or “underpaid.” We find that public-school teachers receive compensation about 52 percent higher than their skills would otherwise garner in the private sector, and we discuss the implications of this fact for education policy in general.

## SALARIES

We begin by introducing the human capital model of wages, using it to compare teacher and non-teacher salaries with adjustments for skill differences between the two groups. We then show how the standard analysis focused on formal educational attainment can be misleading in the case of teachers, whose years of education may not be as valuable in the marketplace as for workers in other occupations. We also compare public-school teacher salaries to private-school-teacher salaries, and we conclude by examining how the average teacher’s wage changes when he or she leaves the profession.

**Initial Wage Analysis.** Public-school teachers receive higher wages than the average worker, but it would be simplistic to conclude that one group is overpaid relative to another group based only on average salaries. Because groups may have different characteristics that affect their productivity, proper comparisons require controlling for worker skills.

*Comparing Jobs versus Comparing Workers.* There are two major ways that researchers attempt to account for skill differences between teachers and non-teachers.

One is to identify occupations that have similar skill requirements as teaching, and to then examine average salaries in those occupations as reported by the Bureau of Labor Statistics (BLS). For example, Jay Greene and Marcus Winters of the Manhattan Institute recently reported that public-school teachers nationwide earn an hourly salary 11 percent higher than other “professional specialty and technical workers,” and 36 percent higher than white-collar workers in general.<sup>4</sup> The major strength of this approach is that it uses compensation data as reported by employers, which is generally more reliable than surveys of individual employees.

Use of the BLS occupational wage data has a number of drawbacks, however. First, the choice of occupations to compare with teaching is subjective. Even systematic methods of identifying comparable occupations rely on assumptions about job characteristics that are hard to verify. Second, occupational comparisons cannot fully account for differences in earnings-related worker characteristics, such as race, gender, marital status, and experience, which may be distributed differently among seemingly comparable occupations. At the federal level, at least, it has been shown that the government hires and promotes employees who have less experience and education than private-sector workers in similar occupations.<sup>5</sup>

In contrast, the “human capital” model focuses on the education, experience, and other skills that employees bring to a job. In this view, if two jobs are comparable in terms of other factors, such as risk and work conditions, the human capital that employees bring to their jobs should account for differences in their compensation. The Congressional Budget Office (CBO) has deemed the human capital approach “the dominant theory of wage determination in the field of economics.”<sup>6</sup>

Our preferred dataset for making worker-to-worker comparisons is the Annual Social and Economic Supplement of the Census Bureau’s Current Population Survey (CPS). The CPS is one of the best datasets for analyzing salaries because of its large sample size and rich set of control variables. It has the drawback of rely-

4. Jay P. Greene and Marcus A. Winters, “How Much Are Public School Teachers Paid?” Manhattan Institute *Civic Report* No. 50, January 2007, at [http://www.manhattan-institute.org/html/cr\\_50.htm](http://www.manhattan-institute.org/html/cr_50.htm) (September 24, 2011).

5. Melissa Famulari, “What’s in a Name? Title Inflation in the US Federal Government,” University of Texas-Austin Working Paper, 2002. See also Congressional Budget Office, “Reducing Grades of the General Schedule Workforce,” September 1984.

6. Congressional Budget Office, “Comparing the Pay of Federal and Nonfederal Law Enforcement Officers,” August 2005, at <http://www.cbo.gov/ftpdocs/66xx/doc6619/08-23-LawEnforcementPay.pdf> (September 24, 2011).

ing on self-reports rather than employer data from the BLS, but it allows us to control for a much larger set of human capital traits.<sup>7</sup>

**Summer Vacation.** It is well known that public-school teachers have shorter average work years than most other job holders. A teacher who receives a given salary for nine months of work is clearly better compensated than someone who earns the same salary for a full year's work.

But just how lengthy summer vacations really are, and to what extent they benefit teachers, are major points of contention among education researchers. Some analysts have tried to avoid the issue by using weekly salaries reported in the CPS during the school year. Theoretically, this allows them to compare teacher and non-teacher earnings per week of paid work, without regard to summer vacation. In many cases, however, weekly salaries in the CPS are simply annual salaries divided by 52 weeks.<sup>8</sup> Using weekly salaries without further adjustment for summer vacation will upwardly bias teacher compensation.

We treated teachers as full-year workers for the purposes of comparing salaries. We first compared the annual CPS salaries of teachers and non-teachers without taking actual time worked during the year into account. The salary variable that we used included only salaries that teachers received from their primary job, thereby excluding earnings from a potential second job taken during summer vacations. We then included the value of summer vacation in the benefits section, showing how different estimates of paid leave affected overall compensation.

**Method and Results.** A representative sample of about 100,000 American households participate in the CPS supplement each year. Because a much smaller number of respondents are teachers, we combined the past 10 years of CPS data, from 2001 through 2010. This

enlarged the sample size by an order of magnitude and gave our results greater precision.

We limited the analysis to respondents who worked full-time jobs in either the private sector or in the state and local sector as teachers. (All federal and non-teacher public workers were excluded.) Private workers were included only if they were employed for all 52 weeks in the past year, while teachers were included who reported working 35 weeks or more.<sup>9</sup> These parameters allowed us to treat both teachers and non-teachers as full-year workers, with paid leave for each group to be added in the benefits section.

We employed ordinary least squares regression, with the log of annual earnings as the outcome variable and the following control variables: usual hours worked per week, experience,<sup>10</sup> experience-squared, years of education, firm size (six categories), immigration status, state of residence, race, gender, marital status, and year indicators to account for inflation. We also included interaction terms: experience  $\times$  education, experience-squared  $\times$  education, marital status  $\times$  gender, and gender  $\times$  race.

The explanatory variable most relevant for our purposes is one that indicates whether someone is a public-school teacher.<sup>11</sup> By including a teacher indicator variable in the regression, we were able determine how the average public-school teacher's salary compares to the salary of a private worker with the same earnings-related characteristics.

Linear regression analysis can tell us how a one-unit change in a particular worker characteristic affects wages when all other characteristics are held constant. For example, Table 1 indicates that an extra year of education is associated with an 11.8 percent increase in the average worker's wages, assuming other characteristics stay the same. As the table shows, the effect on wages of teaching in public school, all else being equal, is -19.3

7. Self-report errors are more common for special income categories (such as self-employment and welfare) than for the wage and salary data that we use. See Daniel H. Weinberg, "Income Data Quality Issues in the CPS," *Monthly Labor Review* (June 2006), pp. 38–45, at <http://www.bls.gov/opub/mlr/2006/06/art4full.pdf> (September 24, 2011).

8. Michael Podgursky and Ruttaya Tongrut, "(Mis)-Measuring the Relative Pay of Teachers," *Education Finance and Policy*, Vol. 1, No. 4 (Fall 2006), pp. 425–440.

9. We also dropped workers with imputed wages, workers who reported less than \$10,000 in annual earnings, and workers who fall outside the 18-to-64 age range.

10. Experience = age - years of education - six.

11. A public-school teacher is someone who is employed by a state or local government and lists his or her occupation as "elementary school teacher" or "secondary education teacher." We opted not to include preschool, kindergarten, and special education teachers in our main analysis, but including them does not significantly change the results.

### Wage Regression Results: Teachers vs. Non-Teachers

Independent Variable	Coefficient
Hours worked per week	1.4%
Experience in years	2.5
Education in years	11.8
Foreign-born	-8.2
Married	22.6
Black	-18.7
Hispanic	-10.3
Female	-15.1
Public school teacher	-19.3
Observations	495,038
Adjusted R-squared	0.41

Sources: Authors' calculations based on data from the U.S. Census Bureau, 2001–2010 Current Population Surveys.

Table 1 • CDA 11-03  heritage.org

percent. In other words, public-school teachers receive salaries that are 19.3 percent lower than non-teachers who have the same observable skills.

We should be careful not to draw strong conclusions about the wages of a single occupation from a regression such as this one. Unobserved ability differences and work conditions could still influence the observed wage gap. If we added an indicator for architects to the regression, for example, we would find that architects receive a wage premium over similarly skilled workers. Yet few people would immediately conclude that architects are “overpaid.” In the next several sections, we explore to what degree work conditions and unobserved ability differences may be affecting the observed teacher wage penalty. We place particular emphasis on the fact that years of education is not a good measure of teacher quality, either within the teaching population or in comparing teachers to members of other professions.

**Problems with Education as a Measure of Teacher Quality.** In standard wage regressions, such as the one we have presented, education is measured either as years of schooling or as level of degree obtained. The implicit assumption is that education’s effect on future earnings is consistent across fields of study—a degree in French literature is treated as equivalent to a degree in engineering or biochemistry. While that may seem like a serious limitation on salary comparisons in general, it is usually not an issue when members of each group work in a wide variety of occupations requiring diverse educational backgrounds. Differences in educational quality at any given educational level tend to average out in heterogeneous groups.

However, a problem exists when comparing the salaries of a single occupational group to the salaries of comparably educated workers in the general population. A large proportion of teachers have bachelor’s or master’s degrees in education. One study estimated that 72 percent of elementary school teachers and almost half of secondary school teachers were education majors.<sup>12</sup> In addition, more than two out of three teachers received their highest degree (typically a master’s) in an education-related field.<sup>13</sup> Because fields of study for teachers are considerably less diverse than for the general population, relying solely on differences in educational *quantity* (years of schooling) may mask important differences in educational *quality* between teachers and non-teachers. In other words, the standard education variable may not be an accurate measure of teacher skill.

Consider the two main ways in which education is related to worker productivity. First, education indicates basic knowledge and experience. Someone who has attended medical school, for example, will usually be better at diagnosing diseases than someone who has only a bachelor’s degree. For teachers, however, there is little evidence that advanced degrees improve performance at all. Carefully constructed value-added models tend to show that teacher effectiveness varies

12. These figures apply to teachers whose highest degree is a B.A. or B.S. Michael F. Thompson and Tanya J. Hall, “Do Teachers Have Education Degrees? Matching Fields of Study to Popular Occupations of Bachelor’s Degree Graduates,” *In Context*, Vol. 11, No. 1 (January–February 2010), at <http://www.incontext.indiana.edu/2010/jan-feb/article2.asp> (September 24, 2011).

13. The figure in 2001 was more than four in five. Low response rates to the NEA’s survey may make their estimates imprecise. National Education Association, “Status of the American Public School Teacher 2005-2006,” March 2010, at <http://www.nea.org/assets/docs/HE/2005-06StatusTextandAppendixA.pdf> (October 21, 2010).

considerably, but “resume characteristics” such as years of schooling, certifications, and experience beyond the first few years of teaching show little to no relationship to student achievement.<sup>14</sup>

A second way that education usually reflects productivity is that educational success can be a proxy for certain personality traits—perseverance and intelligence, for example—that are difficult to measure directly. Employers are often impressed with a job applicant who has completed years of challenging academic work, even if the specific field of study is not directly relevant to the job. This is sometimes referred to as the “sheepskin effect,” where holding a degree signals skills or attributes distinct from those acquired while obtaining the degree.

Elementary school teachers typically possess a degree in elementary or early childhood education. Secondary school teachers, being more specialized, usually major in an academic field or in how to teach a particular field, such as “Math for School Teachers.”<sup>15</sup>

Do these education degrees earned by teachers carry a strong sheepskin effect, as other degrees do? It is unlikely. Given the relative lack of rigor of education courses, many teachers have not faced as demanding a college curriculum as other graduates. More than 50 years ago scholars were already noting the low grading standards in university education departments. *The Journal of Higher Education* reported in 1960 that 32 percent of students in education courses received “A” grades, compared to just 16 percent in business courses.<sup>16</sup>

A half century later, the situation is little changed. Economist Kevin Rask collected data on course grades at a Northeastern liberal arts college from 5,000 students who graduated between 2001 and 2009.<sup>17</sup> Out of the 20 academic departments included in Rask’s data, education awarded the highest grades.

Although Rask’s data come from only one college, his results are consistent with a larger study of three state universities in the Midwest.<sup>18</sup> Economist Corey Koedel recently analyzed grade point averages (GPAs) at Indiana University, the University of Missouri, and Miami University of Ohio. He found that education majors had substantially higher GPAs than students majoring in the hard sciences, social sciences, or the humanities. Education majors at Indiana University, for example, had an average GPA of 3.65, while math, science, and economics students averaged 2.88.

These results could mean that education majors are the brightest and hardest-working college students. However, as the following sections show, it is more likely that education courses are simply easier than, say, chemistry and math classes, which feature stricter grading.

Koedel suggests that grading standards are so low in the education field that distinguishing student performance in education classes has become difficult to impossible. He links his findings to evidence that student effort decreases as grading standards decrease, implying that education majors learn less than other students as a consequence. If so, holding a degree in education should signal less knowledge than a degree in an alternate subject.

Aside from the motivation and perseverance that earning a degree may imply, succeeding in college also suggests that a person possesses a certain raw intelligence useful for many different tasks. However, years of education is a poor proxy for cognitive ability when comparing teachers to non-teachers. Although teachers as a group score above the national average on intelligence tests, their scores fall below the average for other college graduates. This implies that, to the extent that cognitive ability affects earnings independently of education, ordinary wage regressions may overestimate teacher earnings relative to those of other professions.

14. Stephen G. Rivkin, Eric A. Hanushek, and John F. Kain, “Teachers, Schools, and Academic Achievement,” *Econometrica*, Vol. 73, No. 2 (March 2005), at <http://www.econ.ucsb.edu/~jon/Econ230C/HanushekRivkin.pdf> (September 24, 2011).

15. It is unlikely that the latter kind of teaching degree is as rigorous as the pure academic field, but this is a matter of some dispute. National Science Board, “Elementary and Secondary Education: Teacher Quality,” *Science and Engineering Indicators 2004*, pp. 24–30, at <http://www.nsf.gov/statistics/seind04/c1/c1s5.htm#c1s5l3> (September 24, 2011).

16. Robert M. Weiss and Glen R. Rasmussen, “Grading Practices in Undergraduate Education Courses,” *The Journal of Higher Education*, Vol. 31, No. 3 (March 1960), pp. 143–149.

17. Kevin Rask, “Attrition in STEM Fields at a Liberal Arts College: The Importance of Grades and Pre-Collegiate Preferences,” *Economics of Education Review*, Vol. 29, No. 6 (December 2010).

18. Corey Koedel, “Grading Standards in Education Departments at Universities,” University of Missouri *Working Paper*, June 2011, at <http://i.bnet.com/blogs/education-major-study.pdf> (September 24, 2011).

Although the College Board is reluctant to say exactly what the SAT measures, it is essentially an IQ test.<sup>19</sup> In 2010, the College Board asked students taking the SAT about their intended college major. Students who indicated that education was their intended major earned a combined math and verbal score of 967, about 0.31 standard deviations below the average of 1,017, meaning the 38th percentile in a standard normal distribution.<sup>20</sup> In contrast, students intending to major in engineering had average combined SAT scores of 1,118. In a standard wage regression, however, individuals with bachelor's degrees in education and engineering are assumed to possess the same human capital and should earn the same wages, all else being equal.

College graduates who take the Graduate Record Examination (GRE) also indicate their intended field of study when they sit for the test. During the past academic year, students who planned to study elementary or secondary education in graduate school scored 0.13 standard deviations below average on the GRE. If all education-related fields are counted—including special education, early childhood education, and curriculum development—the difference was 0.35 standard deviations.<sup>21</sup>

Not all education majors go on to become teachers, nor do all teachers major in education, but even active teachers exhibit low cognitive ability compared to other college graduates. A recent study examined scores on the ACT—an alternative to the SAT often used in the Midwest—of students who attended public colleges and universities in Missouri. Four-year graduates who became public-school teachers scored 0.23 standard deviations below four-year graduates who did not become teachers.<sup>22</sup>

More broadly, the National Longitudinal Survey of Youth (NLSY) includes scores on the Armed Forces Qualification Test (AFQT), a cognitive test battery simi-

lar to a full-scale IQ test.<sup>23</sup> Teacher scores on the AFQT lag behind other full-time workers with the same education levels by about 0.25 standard deviations.<sup>24</sup> These data indicate that, on average, teachers do not have the same cognitive skills as other college graduates.

As both a direct measure of acquired knowledge and an indirect measure of innate ability, teacher education does not compare well to education in other fields. The result is that years of education could be a highly misleading measure of teacher skill.

**Wage Regression with IQ.** Like the CPS, the NLSY is a rich dataset that includes the earnings-related variables needed to run wage regressions. Though its sample is small compared to the CPS, the NLSY provides the opportunity to test the hypothesis that education is a misleading measure of teacher skill. We constructed a salary model with all of the usual controls *except* for education, which we replaced with the AFQT score. If the teacher salary penalty remains large when an objective measure of cognitive ability is used in place of education, then we can reject our hypothesis.

As the name implies, the NLSY is a longitudinal survey that began interviewing young adults between the ages of 13 and 21 in 1979. Each successive wave tracked the growth and development of the original interviewees. In order to obtain the largest sample of NLSY teachers possible, we combined data from the 1990 through 1994 waves. These years contain wage data modeled on the CPS collection procedure, and they come before dropouts from the sample became a large issue.

Using the log of wage-indexed hourly wages as the dependent variable, we ran regressions with and without education and AFQT as explanatory variables. All of the regressions used the following control variables: experience, experience-squared, establishment size (four categories), firm size (two categories), immigration status, region of residence, residence in a metropolitan

19. Meredith C. Frey and Douglas K. Detterman, "Scholastic Assessment or g? The Relationship Between the Scholastic Assessment Test and General Cognitive Ability," *Psychological Science*, Vol. 15, No. 6 (2004), pp. 373-378.

20. College Board, "Total Group Profile Report," 2010, at <http://professionals.collegeboard.com/profdownload/2010-total-group-profile-report-cbs.pdf> (September 24, 2011).

21. Educational Testing Service, "Guide to the Use of Scores 2010-11," at [http://www.ets.org/s/gre/pdf/gre\\_guide.pdf](http://www.ets.org/s/gre/pdf/gre_guide.pdf) (September 24, 2011).

22. Michael Podgursky, Ryan Monroe, and Donald Watson, "The Academic Quality of Public School Teachers: An Analysis of Entry and Exit Behavior," *Economics of Education Review*, Vol. 23 (2004), pp. 507-518.

23. For the psychometric properties of the AFQT, see R. Darrell Bock and Elsie G. J. Moore, *Advantage and Disadvantage: A Profile of American Youth* (Hillsdale, NJ: Lawrence Erlbaum Associates, 1986).

24. Based on the authors' calculations using the sample of teachers described in the next section, "Wage Regression with IQ."

### Teacher Wage Regressions with Education and Armed Forces Qualification Test (AFQT)

Row	Key Controls Included		Teacher Wage Effect (%)	R-squared
	Education	AFQT		
1	Yes	No	-12.6*	0.31
2	Yes	Yes	-10.7*	0.33
3	No	Yes	0.6	0.29

\* Significant at 95 percent level.

**Note:** All three regressions include controls for experience, experience-squared, establishment size, firm size, immigration status, region of residence, residence in a metropolitan area, race, gender, and marital status.

**Source:** Authors' calculations based on data from the U.S. Department of Labor; Bureau of Labor Statistics, 1990–1994 waves of the 1979 National Longitudinal Survey of Youth.

Table 2 • CDA 11-03 [heritage.org](http://heritage.org)

area, race, gender, marital status, and an indicator variable for public-school teacher. We omitted state indicators, year indicators, and interaction terms because of the smaller sample size.

Table 2 shows how teacher salaries change depending on whether education or AFQT is included in the regression. The first row is the “standard” regression based on our CPS analysis in the previous section: Years of education are controlled for, but AFQT is not. The standard regression shows a teacher salary penalty of 12.6 percent.

The second row includes both education and AFQT in the same regression. The impact on teacher wages is small: The penalty decreases by less than two percentage points. The third row again includes AFQT but now omits education. With this specification, the change is dramatic: The teaching penalty is gone, replaced by a statistically insignificant premium.

How to interpret these results? On the one hand, the difference in IQ between teachers and other college graduates *by itself* has only a small effect on estimates of the teacher penalty. As the second row indicates, teachers with both the same education and AFQT score as other workers still receive 10.7 percent less in wages.

However, as we have shown, education is a misleading measure of teacher skills in several ways. In addition

to the IQ difference between teachers and non-teachers, the education major is among the least challenging fields of study, and years of education subsequently have little to no effect on teacher quality. This suggests that eliminating education as a control variable and letting AFQT alone account for skills (as in the third row) may provide the most accurate wage estimates.

Replacing education with an objective measure of skills eliminates the observed teacher penalty, indicating that non-teachers with the same education as a typical teacher will likely have more applicable skills. We emphasize that a job is not necessarily less important or less challenging when the credentials for it are easier to obtain. Indeed, effective teachers are highly valuable to society and the economy.<sup>25</sup> Effective teaching does have skill requirements, including patience and empathy, which disqualify many people from the profession. Our point is that traditional skill measures do not allow for a fair salary comparison of teachers to non-teachers.

#### Public-School Teachers versus Private-School Teachers.

A better assessment of teacher pay may come from changing the comparison group. Rather than compare public-school teacher salaries with the salaries of all private workers, the salary comparison could compare teachers in the public sector with teachers in the private sector. This approach largely avoids the problems described in the previous section. We need not worry about how the value of education changes by occupation when everyone involved in the comparison is a teacher.

A teacher-to-teacher comparison also helps to eliminate intangible work-related factors from the analysis. If there are certain aspects of teaching that are particularly frustrating (or rewarding) relative to other occupations, a higher (or lower) salary for teachers may be required as a compensating differential. By limiting both the reference and comparison group to teachers, whatever salary differences we observe are less likely to be driven by these intangible factors.

Table 3 shows the results of a salary regression that was limited to elementary and secondary teachers. The data and model specification was the same as our earlier CPS analysis, except now the variable of interest is *public school*, which shows the salary premium associated with working for a public school rather than a

25. Eric A. Hanushek, “The Economic Value of Higher Teacher Quality,” National Bureau of Economic Research *Working Paper* No. 16606, December 2010.

## Wage Regression Results: Public School Teachers vs. Private School Teachers

Independent Variable	Coefficient
Hours worked per week	0.3%
Experience in years	-2.3
Education in years	8.7
Foreign-born	-3.7
Married	5.5
Black	-4.5
Hispanic	1.2
Female	-3.5
Public school teacher	9.8
Observations	21,092
Adjusted r-squared	0.35

Sources: Authors' calculations based on data from the U.S. Census Bureau, 2001–2010 Current Population Surveys.

Table 3 • CDA 11-03  heritage.org

private school. With all observable skills held constant, public-school teachers nationally earn 9.8 percent *more* in salaries than private-school teachers.

The change in relative salaries for public-school teachers is drastic—a 19.3 percent penalty when compared to private workers in general, as opposed to a 9.8 percent premium when compared to private-school teachers. The choice of comparison group obviously makes a substantial difference in the results, but which choice is preferable? We have already discussed the problems with using private workers as the comparison group, and how they may be mitigated by using private teachers. However, the use of private teachers as the comparison group has its own problems.

Public and private schools do not necessarily perform the same functions. While public schools must provide a general education to motivated and unmotivated students alike, private schools have more varied missions. Elite private schools often feature specialized curriculums directed at select groups of students. Consequently, the skills needed for private-school teaching may be somewhat different than the skills needed for

teaching in a public school. The religious mission in particular of many private schools could also affect the attractiveness of teaching. For example, teachers in sectarian schools often consider their work to be part of their religious service, meaning they may accept below-market salaries.

If public schools ceased to exist, the demand for secular private schools with a standard curriculum would presumably increase, changing the private labor market for teachers. For this reason, the salaries of private-school teachers in general do not necessarily reflect the “true” labor market value of public-school teachers. To better estimate the true market value, we can restrict the comparison even further. By excluding private schools with religious missions or non-standard curriculums, the comparison of teacher salaries in the public and private sector becomes clearer.

Michael Podgursky, an economist at the University of Missouri–Columbia, has used the Department of Education’s School and Staffing Survey to perform that analysis.<sup>26</sup> After controlling for education, gender, region, and metro status, Podgursky found that public-school teachers earn higher salaries than teachers in non-sectarian and standard-curriculum private schools. The salary premium for public-school teachers ranged from 9 percent to 28 percent depending on teacher experience, with the least experienced receiving the highest premiums.

**Salaries of Teachers Who Leave the Profession.** Another method of comparison examines the salaries of teachers who leave the profession. If public-school teachers receive lower salaries than they could otherwise earn in the private market, we would expect a large portion of those who leave teaching to take new jobs that pay better.

Evidence from Georgia and Missouri, however, indicates this is not the case. According to state data from the 1990s, just 4 percent of Georgia elementary teachers who left their jobs for a non-education field were earning more than the minimum teaching wage a year after their exit. The same figure for exiting high school teachers was 5 percent.<sup>27</sup> In Missouri, women who quit teaching earned just 73 percent as much as their teach-

26. Michael Podgursky, “Fringe Benefits,” *Education Next*, Vol. 3, No. 3 (Summer 2003), at <http://educationnext.org/fringebenefits/> (September 25, 2011).

27. Benjamin Scafidi, David L. Sjoquist, and Todd R. Stinebrickner, “Do Teachers Really Leave for Higher Paying Jobs in Alternative Occupations?” *Advances in Economic Analysis and Policy*, Vol. 6, No. 1 (2006), at <http://www.gppf.org/pub/education/advances.pdf> (September 25, 2011).

ing wage in their new non-teaching jobs. Male teachers who quit saw no change in their average salaries.<sup>28</sup>

We can broaden the scope of these results using the Survey of Income and Program Participation (SIPP), along with a regression technique called “fixed effects.” The regression analyses we have presented so far have been cross-sectional, meaning they compare different workers with similar skills at a single point in time. In contrast, a fixed effects analysis follows the same workers over time as they switch into and out of the teaching profession.

The major benefit of this approach is that it automatically controls for differences in unobserved abilities—intelligence, motivation, empathy, etc.—because the individual teachers carry these attributes with them from job to job. If the *same* worker—not merely a worker with similar skills—is paid less in a non-teaching job, it is difficult to argue that he or she was underpaid as a teacher.

The SIPP is a longitudinal dataset that follows about 50,000 households over three to four years. During this period, many survey participants changed jobs, with some switching between teaching and non-teaching careers. To bolster the number of switchers into and out of teaching, we combined the 2001, 2004, and 2008 SIPP panels. We then examined the average percentage change in inflation-adjusted monthly wages experienced by workers who switch from a non-teaching job to a teaching job (group abbreviation: NT), a teaching job to a non-teaching job (TN), one teaching job to another teaching job (TT), and, as a control, a non-teaching job to another non-teaching job (NN).<sup>29</sup>

Of course, workers often change jobs because they have acquired new skills that justify a higher salary, and the fixed effects regression allows us to include controls for observable changes in age, education, marital status, region of residence, and residence in a metropolitan area. Worker characteristics that do not change over time, even those that are not directly observable, are automatically controlled for in this analysis.

### Wage Change After Job Switch

Label	Job Change		Wage Change (%)	Significance Level	Number
	First Job	Second Job			
NN	Non-teaching	Non-teaching	0.5	99%	24,308
NT	Non-teaching	Teaching	8.8	99%	148
TN	Teaching	Non-teaching	-3.1	99%	145
TT	Teaching	Teaching	5.4	99%	325

**Notes:** Full-time civilian workers only. Wage changes are adjusted for changes in age, education, marital status, region, and residence in a metropolitan area, using fixed effects regression analysis. See text for details.

**Source:** Authors' calculations based on data from the U.S. Census Bureau, 2001, 2004, and 2008 panels of the Survey of Income and Program Participation.

Table 4 • CDA 11-03  heritage.org

Table 4 indicates that the control group that shifts from non-teaching jobs to other non-teaching jobs experiences a real wage increase of only 0.5 percent. Workers who switch from non-teaching to teaching receive a larger increase of 8.8 percent. Teachers who change to non-teaching jobs, on the other hand, see their wages *decrease* by 3.1 percent. In other words, the effect on wages of switching into or out of a teaching job is precisely the opposite of what one would expect if teachers were underpaid.

Given the small number of workers switching between teaching and non-teaching, these data should not be considered precise, but they at least cast strong doubt on the notion that teachers are underpaid in wages.

Why does the fixed-effects approach show a salary premium for teachers, while the earlier cross-sectional regression showed a penalty? The traditional controls in a cross-sectional regression do not adequately measure teacher skills. By following the same workers over time, fixed effects models capture worker characteristics that are not directly observable. Once those previously unmeasured characteristics enter the analysis, the large teacher wage penalty appears to become a small premium.

**The Bottom Line on Teacher Salaries.** The claim that public-school teachers endure a salary penalty is dubious. Although the “standard” wage regression sug-

28. Podgursky, Monroe, and Watson, “The Academic Quality of Public School Teachers.”

29. “Teacher” here refers to public-school teachers. A small number of private-school teachers will be included in the non-teacher category.

gests that teachers receive about 19 percent lower salaries than similarly skilled full-time workers, the regression is flawed. Important differences exist between teachers and workers in other occupations that are obscured by traditional control variables.

Years of education, in particular, is a misleading measure of teacher skill, both within the teaching profession and between teaching and non-teaching occupations. The field of education is less challenging than other academic concentrations, and teacher education has little measurable effect on classroom performance. Furthermore, teachers have significantly lower cognitive ability, on average, than non-teachers with the same level of education. Removing education from a wage regression and replacing it with a measure of raw cognitive ability appears to erase the teacher salary penalty. Clearly, the standard regression masks important facts about teacher skills.

Teacher-to-teacher comparisons avoid the problem of measuring skills across occupations. Public-school teachers receive significantly higher salaries than private-school teachers, even more than private teachers at secular general-education schools.

Finally, workers who switch from non-teaching to teaching jobs increase their wages on average, while workers who switch jobs in the other direction see their wages *decrease*. The totality of the evidence suggests that public-school teachers are not underpaid in wages by private-sector standards, and they may even be overpaid.

## BENEFITS

Evaluating the level of benefits enjoyed by public-school teachers is more challenging than analyzing their salaries, for two main reasons. First, some benefits (such as pensions) are accrued during a person's working life but not collected until retirement. For benefits that are delivered in the present, such as health coverage, paid leave, or taxes paid on a worker's behalf, the employer's contribution toward these benefits is a good measure of what employees actually receive. However, for pensions, retirement health benefits, and other deferred compensation, the current employer contribution is a poor indicator of the actual benefits to be received. The reason is that employers often disagree about what current contributions are needed to

finance the same future benefit. To accurately calculate the value of deferred benefits, it is necessary to control both for how much the employer contributes and how that employer calculates the required contribution. We make this adjustment as needed.

A second challenge to measuring benefits is that no comprehensive dataset exists that would allow the kind of direct individual comparisons presented in the previous sections on salaries. Data must be pieced together from separate sources. Our starting point is the Employer Costs for Employee Compensation (ECEC) survey published by the Bureau of Labor Statistics, supplemented by additional data sources as needed.

The ECEC dataset does not report benefits at the individual level; rather, benefits are reported on an aggregated basis by industry, firm size, profession, and other employer characteristics. The ECEC does list benefits specifically for public-school teachers, albeit at lower levels of detail than are available for the workforce as a whole.

For simplicity, benefits are reported as a percentage of wages. Table 5 shows the main benefit categories for public-school teachers in 2010. Total employer contributions toward benefits are reported as equal to 41.2 percent of teacher salaries. Subcategories include:

- Paid leave (6.6 percent of wages)—paid vacation, holidays, and sick leave;
- Insurance plans (16.1 percent)—health, disability, life, and other insurance protections;
- Retirement and savings (11.1 percent)—defined-benefit pensions and defined-contribution pensions; and
- Legally required benefits (7.4 percent)—employer taxes toward Social Security, Medicare, unemployment and workman's compensation insurance, among others.

We compared teachers to workers in establishments of 100 or more employees.<sup>30</sup> The latter group receives benefits equal to 41.3 percent of salaries, making teacher benefits appear comparable. An alternate comparison group based on occupation would be “full time professionals, and related”—this group tends to receive lower average benefits than the private-sector 100+ category, making the comparison shown in this section relatively conservative.

30. Establishment size is the number of employees at a particular location; firm size is the total number of employees in an organization.

## Average Benefits as a Percentage of Wages, Initial Data

Public-School Teachers and Private Workers in Establishments of 100 Employees or More, in 2010

	Public-School Teachers	Private Workers
Total benefits	41.2%	41.3%
Paid leave	6.6%	11.4%
Insurance plans	16.1%	13.3%
Retirement and savings	11.1%	5.4%
Legally required benefits	7.4%	11.3%

**Source:** Authors' calculations using data from U.S. Department of Labor, Bureau of Labor Statistics. Note: The BLS benefits category "supplemental pay" is omitted, as these values are included in CPS wages.

Table 5 • CDA 11-03  heritage.org

Combining similar benefit levels with standard estimates of the teacher salary differential, which the prior section showed are flawed, one could easily conclude that public-school teachers are substantially under-compensated relative to private-sector workers. However, there are several important ways in which the BLS data understate the total fringe benefits paid to public-school teachers:

- First, the BLS data on employer contributions to pensions fail to adjust for the public sector's more aggressive funding rules, which imply significantly higher guaranteed benefits per dollar of employer contributions compared to the private sector.
- Second, BLS data exclude retiree health coverage. Most teachers and other public-sector employees receive this coverage, but most private-sector workers do not.
- Third, the "paid leave" category in the BLS data does not account for the shorter working year enjoyed by most teachers.

After a full accounting, benefits for teachers are shown to be significantly more generous than those paid to employees of large private-sector establishments.<sup>31</sup>

**Pensions.** Most evaluations of public-sector and private-sector compensation compare employer retirement

plan contributions without accounting for important differences in how pensions are financed. As a result of this error, individuals who would receive exactly the same benefits in retirement could be credited with very different levels of "pension compensation" while working.

Part of the confusion stems from the different types of retirement plans. A defined-contribution (DC) plan, such as a 401(k) or a 403(b), is an account owned and invested by the worker himself. Many employers will make regular contributions to DC accounts as part of their worker retirement plans, but no specific level of benefits is guaranteed. The employer's obligation begins and ends with its annual contribution. If every worker had a DC pension, it would be easy to compare their retirement benefits—just look at their employers' annual contributions to the accounts.

A defined-benefit (DB) plan is essentially an annuity—a regular, fixed sum paid to workers after they retire. In order to have the money needed to pay for DB pensions, employers usually set aside funds each year to be invested. But employers do not set aside \$1 for every \$1 in pension benefits they must eventually pay. Instead, they assume a certain rate of return on their investments and then contribute an amount that they expect to grow to the proper level needed in the future.

While the annual employer contribution to DC plans is equivalent to the retirement benefit workers receive, the employer set-aside for DB pension funding is *not* the same as the benefit. The higher the employer assumes the rate of return will be, the lower the annual set-asides for DB pensions need to be, even as the actual retirement benefit to workers stays at the same guaranteed level.

Public-sector pensions finance their benefits with a more aggressive funding strategy than private-sector plans. A funding strategy, in simple terms, encompasses how much the employer contributes to fund pension benefits and how those contributions are invested. An aggressive funding strategy implies lower contributions invested in higher risk assets, such as stocks, private equity, and hedge funds. Public-sector pensions invest in assets with an expected return of around 8 percent, which allows them to make lower contributions as long as the returns come as expected. If pension investments

31. Several prior studies have erroneously assumed that the BLS ECEC data account for all of the major benefits that employees receive, without making the adjustments we discuss in the following sections. See, for example, Sylvia A. Allegretto, Sean P. Corcoran, and Lawrence Mishel, *How Does Teacher Pay Compare? Methodological Challenges and Answers* (Washington, DC: Economic Policy Institute, 2004).

fall in value, then public employers—meaning, ultimately, taxpayers—must increase their contributions to the pension funds. Because the risk is borne by taxpayers, the average public worker is effectively guaranteed an 8 percent return.

This guarantee makes comparisons of pension plans difficult. As a recent paper published by the Center for State and Local Government Excellence noted, “contributions to private sector 401(k) plans and public sector defined benefit plans are not comparable. The public sector contribution guarantees a return of about 8 percent, whereas no such guarantee exists for 401(k)s. Thus, the public sector contribution *under-states* public sector compensation.”<sup>32</sup> (Emphasis in original.)

In DC plans, which are predominant in the private sector, all the market risk is borne by the worker. If a worker wants a guaranteed benefit in retirement comparable to that received by a public-school teacher, he must invest his account in guaranteed assets: U.S. Treasury securities, yielding around 4 percent over 20 years.

These higher returns show themselves in higher benefits. According to the Public Plans Database compiled by the Center for Retirement Research at Boston College, the average teacher pension plan required an employee contribution of 5.1 percent of wages and paid benefits equal to 1.8 percent of final wages multiplied by the number of years of service.<sup>33</sup> To illustrate, imagine a teacher who retired after 30 years of service with an annual salary of \$40,000. Her annual DB pension benefit would be about \$20,330.<sup>34</sup>

Now consider what she might receive in a private 401(k) plan. According to BLS data in Table 5, the average employer pension contribution was about 5.4

percent of earnings. We assume that, like the teacher pension, employees contribute 5.1 percent of their own pay. Following the practice of the CBO, we assume a 4 percent interest rate on 401(k) contributions to match the guaranteed nature of DB pension benefits. At retirement, the total account balance would equal \$96,131, sufficient to purchase a lifetime inflation-indexed annuity paying \$4,450 per year.<sup>35</sup>

Therefore, assuming equal employee contributions, the teacher can expect to receive retirement benefits that are roughly 4.5 times higher than she would receive from a typical private-sector pension. This does not mean that every teacher receives such generous benefits. Since pension benefits tend to accrue much faster near the end of a teaching career, a teacher who changes jobs early in her career may even lose money.<sup>36</sup> On average, however, public-sector pensions are simply far more generous than private-sector plans.

Compound interest is said to be the most powerful force in the universe. In the example above, the difference between a 4 percent return and an 8 percent return, compounded over a working lifetime, results in a much higher DC contribution rate needed to generate the same benefits as a DB plan. A similar dynamic takes place with private-sector DB pension plans, though private plans are not allowed to discount their liabilities as aggressively as public-sector DB pensions.

The Teachers Pension and Annuity Fund of New Jersey illustrates the scale of the issue. The fund reports that the average new retiree in 2009 claimed benefits at age 61 and received an annual benefit of around \$46,500. To finance the accrual of these benefits, the fund required total annual contributions equal to approximately 8 percent of worker wages.<sup>37</sup> From this, one might infer

32. Alicia H. Munnell, Jean-Pierre Aubry, Josh Hurwitz, and Laura Quinby, “Comparing Compensation: State–Local Versus Private Sector Workers,” Center for State and Local Government Excellence, September 2011, at [http://www.slge.org/index.asp?Type=B\\_BASIC&SEC={6B5D32FD-C99D-41F7-9691-4F1B1D11452B}&DE={43B3A1F9-3BCB-4EDB-A334-7F4B183BF3B2}](http://www.slge.org/index.asp?Type=B_BASIC&SEC={6B5D32FD-C99D-41F7-9691-4F1B1D11452B}&DE={43B3A1F9-3BCB-4EDB-A334-7F4B183BF3B2}) (September 25, 2011).

33. Public Plans Database, at <http://pubplans.bc.edu/pls/html/db/f?p=198:3:945369477816020::NO> (September 30, 2011). These figures are for plans where the employee participates in Social Security, to allow for a more straightforward comparison of benefits.

34. This assumes that her wages grew 5.5 percent each year, the average rate of total wage growth assumed by teacher plans in the Public Plans Database. This produces average earnings over her final three years of employment of \$37,648.

35. Based on rates published by the federal government’s Thrift Savings Plan.

36. Robert M. Costrell and Michael Podgursky, “Golden Handcuffs,” *Education Next*, Vol. 10, No. 1 (Winter 2010), at <http://educationnext.org/golden-handcuffs/> (October 12, 2011).

37. These figures drawn from “Teachers’ Pension and Annuity Fund of New Jersey: Actuarial Valuation Report,” *Milliman*, June 30, 2009, at <http://www.state.nj.us/treasury/pensions/pdf/financial/09tpafvaluationreport.pdf> (September 25, 2011). New Jersey used a discount rate of 8.25 percent for its calculations. In addition to the contributions outlined above, New Jersey must make contributions to finance unfunded liabilities from prior years. These are not considered part of current compensation.

that the implicit value of “pension compensation” is 8 percent of wages. However, a private-sector DB pension plan promising exactly the same benefits would need to set aside a much larger amount, equal to almost 19 percent of worker pay. A DC plan that sought to guarantee the same level of retirement benefits would need to set aside an even greater amount, about 27 percent of salaries. These disparate contribution rates are driven not by the generosity of the plans’ benefits themselves, but simply by different accounting rules.

Note that the question here is not whether state and local pensions should assume a 4 percent riskless rate of return when deciding how to value their pension obligations, although almost all economists believe that they should.<sup>38</sup> When measuring the value of benefits paid as compensation to employees, that debate is irrelevant. Even if state and local governments could somehow generate higher pension benefits with less risk and lower costs than the private sector, those higher benefits should not be excluded from the tally of public-sector compensation. The savings from the alleged government efficiency could just as well be devoted to other government outlays or tax reduction rather than higher employee compensation.

To properly compare pensions, we need to adjust for differences in how pension contributions are calculated. The basic approach is to convert employer DB contributions to the amount necessary to fund the same benefits using a DC account.<sup>39</sup> This approach ensures that the same dollar amount of future retirement benefits will be converted to the same level of pension compensation today, regardless of whether benefits are paid from a public-sector DB plan, a private-sector DB plan, or a DC plan.

Data from the Public Plans Database for 2009 shows that state and local pensions that include teachers have an average cost of annual benefit accruals (called the “normal cost” in pension parlance) of 12.4 percent of wages, when discounted at the 7.9 percent average interest rate assumed by teacher pensions in the database. This normal cost is split between employers (a 6.7 percent average contribution rate) and employees (5.7 percent).

We first adjusted the 12.4 percent total normal cost to account for differences in discount rates. Our principal source was a March 2011 analysis prepared for the Florida Retirement System (FRS) by the actuarial firm Milliman, in which the normal costs of nine pension plans under the FRS were calculated using a range of discount rates.<sup>40</sup> Using these figures, we calculated an adjustment factor which equaled the normal cost of the average FRS plan using a 4 percent discount rate divided by the normal cost assuming a 7.9 percent discount rate, the average interest rate assumed by teacher pension plans.<sup>41</sup>

The resulting quotient, 2.94, was multiplied by the reported 12.4 percent average normal cost for teacher pensions, resulting in a total normal cost of 36.5 percent of payroll. This is the contribution to a DC pension account, compounded at the government bond rate of return, which would generate the same guaranteed pension benefit at retirement as the typical teacher pension plan. From this we subtracted the average employee contribution of 5.7 percent of payroll, for a total DB pension compensation of 30.8 percent of wages.<sup>42</sup>

In addition to DB pensions, teachers receive average employer contributions to DC pension plans of 1.2 percent of wages, for a total employer contribution toward

38. Congressional Budget Office, “The Underfunding of State and Local Pension Plans,” *Economic and Budget Issue Brief*, May 4, 2011, at <http://www.cbo.gov/doc.cfm?index=12084> (September 25, 2011), and Jeffrey R. Brown and David W. Wilcox, “Discounting State and Local Pension Liabilities,” *American Economic Review*, Vol. 99, No. 2 (May 2009).

39. Our approach is explained in more detail in Andrew G. Biggs and Jason Richwine, “Comparing Federal and Private Sector Compensation,” American Enterprise Institute *Working Paper*, June 8, 2011, at <http://www.aei.org/paper/100203> (September 25, 2011).

40. Robert S. DuZebe, “Study Reflecting Impact to the FRS of Changing the Investment Return Assumption to One of the Following: 7.5%, 7.0%, 6.0%, 5.0%, 4.0% and 3.0%,” *Milliman*, March 11, 2011.

41. The use of a 4 percent riskless discount rate is common in the academic literature on public-sector pensions and approximates market yields in the mid-2009 time frame in which the normal costs from above were calculated. However, yields on Treasury securities are currently well below 4 percent, meaning it would be even more expensive to provide a given dollar value of guaranteed future retirement benefits. See Robert Novy-Marx and Joshua D. Rauh, “Public Pension Promises: How Big Are They and What Are They Worth?” *Journal of Finance*, forthcoming.

42. In “Comparing Compensation,” Munnell et al. use a very similar method in their analysis of state and local employee pensions, but they assume a riskless discount rate that is higher than the one used in the academic literature.

## Why Do Teacher Advocates Claim that Pension Benefits Are Modest?

In Illinois, where public pension funding has been especially controversial, the state's Teachers' Retirement System has pointed out that the average teacher's pension is "only" around \$43,000 per year.<sup>43</sup> While significantly higher than a typical retiree's pension, the number is misleadingly low. It is not an average for teachers retiring today; rather, it includes teachers who retired years or decades ago who, because salaries were lower in the past, receive lower pensions than a teacher retiring today. The 2010 actuarial report for the Teachers' Retirement System of Illinois shows, for instance, that retirees between the ages of 55 and 59 receive average annual benefits of \$55,893.<sup>44</sup>

Even that figure is deceptive because it includes benefits paid to individuals who worked only part of their careers in public schools. These retirees would receive lower average benefits, but they may have retirement income drawn from another job. The 2010

Comprehensive Annual Financial Report in Illinois shows that the average benefit paid to a 60-year-old retired teacher with 35 to 39 years of service—a full working career—was \$67,452.<sup>45</sup>

Illinois teachers do not pay into, and do not receive, Social Security benefits, meaning that comparisons to private-sector workers should include both private pensions and Social Security benefits. Advocates for teachers sometimes suggest that their inability to participate in Social Security is a disadvantage. However, Social Security pays middle-income and upper-income workers a below-market rate of return, generating benefits around one-third lower than workers could receive by investing in safe government bonds.<sup>46</sup> In contrast, public pensions pay employees more than three times the total bond yield. By and large, teachers and other public employees *benefit* from not participating in Social Security.

retirement and savings of 32 percent. In contrast, the typical private-sector retirement and savings component of compensation equals only 6.2 percent of wages, even after adjusting private-sector DB contributions in a similar manner to public-sector DB plans above.

**Retiree Health Benefits.** BLS benefits data do not include information on health coverage provided to retirees. Most public-sector employees, including school teachers, become eligible to receive health benefits in retirement. Economists Robert Clark and Melinda Morrill note that retiree health insurance plans "cover virtually all full-time public sector employees."<sup>47</sup> Retiree health benefits are extremely valuable for early retiring public employees, who otherwise would need to acquire health coverage in the more expensive indi-

vidual insurance market until they became eligible for Medicare benefits at age 65.

In the private sector, retiree health coverage is less common and less generous. Data from the Medical Expenditure Panel Survey indicate that roughly 18 percent of employees work for employers who offer retiree health coverage, but in many cases that coverage has been frozen or restricted. A Kaiser Family Foundation survey reports that 29 percent of companies that report offering retiree health coverage do *not* offer it to newly hired workers.<sup>48</sup> Other companies have frozen further accumulations of retiree health benefits. Thus, significantly fewer than 18 percent actually are truly eligible for such coverage. In addition, as the Pew Foundation has noted, of the large private firms "that do offer ben-

43. Teachers' Retirement System of the State of Illinois, "Teacher Pensions are too 'Generous,'" at <http://trs.illinois.gov/subsections/press/TRSIssuesUpdate.htm#teacherpensions> (October 21, 2011).

44. Buck Consultants, "Teachers' Retirement System of the State of Illinois. Actuarial Valuation of Pension Benefits as of June 30, 2010," December 2010.

45. Teachers' Retirement System of the State of Illinois. "Comprehensive Annual Financial Report. For the fiscal year ended June 30, 2010," December 22, 2010.

46. Office of the Chief Actuary, Social Security Administration, "Moneys Worth Ratios Under the OASDI Program for Hypothetical Workers," July 2010.

47. Robert Clark and Melinda S. Morrill, "The Funding Status of Retiree Health Plans in the Public Sector," National Bureau of Economic Research *Working Paper* No. 16450, October 2010.

48. "Employer Health Benefits: 2008 Summary of Findings," The Kaiser Family Foundation and Health Research and Educational Trust, at <http://ehbs.kff.org/images/abstract/7791.pdf> (September 25, 2011).

efits, they tend to be considerably less generous than those offered by state governments.”<sup>49</sup> Many private employers have both tightened eligibility standards and increased cost-sharing through new formulas or explicit global caps on employer subsidies.<sup>50</sup>

It is possible to estimate the value of retiree health coverage on a system-by-system basis through disclosures required by the Government Accounting Standards Board (GASB). According to GASB, retiree health benefits—which are referred to as “Other Post Employment Benefits” (OPEB)—“are a part of the compensation that employees earn each year, even though these benefits are not received until after employment has ended.”<sup>51</sup> These reports, required by GASB Rules 43 and 45, measure the value of accruing retiree health benefits as a percentage of workers’ salaries, just as we measure other benefits as a percentage of salaries in the above sections. This value, known as the “normal cost” of accruing benefits, “can be thought of as the cost for OPEB being earned by employees in exchange for [their] services now.”<sup>52</sup> It allows adjustments to BLS data to include the value of retiree health coverage.

The generosity of retiree health coverage varies significantly. In some cases, retired teachers are merely allowed to buy into health coverage provided to working-age teachers. This provision still counts as a subsidy, since it allows retired teachers to purchase coverage at the price offered to younger working-age teachers.

## Retiree Health Costs

Retiree Health Coverage Costs for Teachers for Select Areas, as Percent of Salaries

Milwaukee, WI	17.3%	New Jersey	7.9%
North Carolina	12.5%	Georgia	5.3%
Louisiana	12.2%	Washington	3.7%
Hawaii	11.2%	Ohio	3.1%
Boston, MA	9.6%	Maine	2.1%
San Francisco, CA	8.9%	Connecticut	1.0%
Illinois	8.3%		

Sources: See footnote 53.

Table 6 • CDA 11-03  heritage.org

Some employers provide explicit subsidies toward health coverage, and in some cases all costs are covered by employers, meaning retired teachers face very few out-of-pocket costs.

Unfortunately, no national-level data on retiree health care exist, meaning that we can illustrate benefits only on a case-by-case basis. The situation is even more complicated for teachers, since retiree health is sometimes provided by individual school districts even when teachers participate in a statewide pension plan. Table 6 provides a selection of available retiree health disclosures. The normal costs for the sample averages

49. The Pew Center on the States, “Promises With a Price: Public Sector Retirement Benefits,” December 2007.

50. “Retiree Health Benefits Examined,” Kaiser Family Foundation and Hewitt Associates, December 2006, at <http://www.kff.org/medicare/upload/7587.pdf> (March 25, 2011).

51. Governmental Accounting Standards Board, “Other Postemployment Benefits: A Plain-Language Summary of GASB Statements No. 43 and No. 45,” at [http://www.gasb.org/project\\_pages/opeb\\_summary.pdf](http://www.gasb.org/project_pages/opeb_summary.pdf) (September 29, 2011).

52. California Department of Education, “Definitions of Key Terms,” February 26, 2007, at <http://www.cde.ca.gov/fg/ac/col/documents/gasb45attha.doc> (September 29, 2011).

to about 8 percent of wages, which we will use as a representative value in our calculations.<sup>53</sup> However, it is worth reiterating that the generosity of retiree health coverage varies from place to place. In analyzing any specific state, city, or school district, a local value should be used.

The figures presented in Table 6 reflect the cost to the government, not the full value to employees. Lacking retiree health coverage, a retired public-sector employee would purchase coverage in the individual market, where costs are on average 25 percent higher than under group coverage.<sup>54</sup> Thus, a stated cost to employers of 8 percent of salaries for retiree health coverage would have a value to employees of 10 percent of their salaries.

Given the data problems outlined above, it is impossible to value private-sector retiree health coverage precisely. The coverage value is likely quite small, but we can develop a rough estimate by multiplying the retiree health care value for public-school teachers (10 percent of wages) by an assumed private coverage rate of 18 percent, then further multiplying by 70 percent to account for employers who report offering retiree health coverage but have frozen their plans to new hires or who have halted accruals of new benefits. This produces a private-sector value of 1.3 percent of wages.

**Paid Leave.** The BLS reports that public-school teachers receive paid leave equal to 7 percent of sala-

### Average Benefits as a Percentage of Wages, Adjusted Data

Public-School Teachers and Private Workers in Establishments of 100 Employees or More, in 2010

	Public-School Teachers	Private Workers
Total benefits	100.8%	43.5%
Paid leave	6.6%	11.4%
Insurance plans	16.1%	13.3%
Retirement and savings	32.0%	6.2%
Retiree health care	9.9%	1.3%
Legally required benefits	7.4%	11.3%
Work-year leave	28.8%	0.0%

**Source:** Authors' calculations based on data from the U.S. Department of Labor, Bureau of Labor Statistics, and pension/retiree health care plan disclosures.

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ries on average. For private-sector workers in establishments of 100 employees or more, the comparable value is 11.4 percent of pay, counterintuitively implying much less paid leave for school teachers. Stranger still, BLS reports that state and local employees on average receive paid leave equal to 12.5 percent of salaries, implying that public-school teachers receive significantly less paid leave than other public employees,

53. The following are the sources for each cell in Table 6, "Retiree Health Coverage Costs for Teachers for Select Areas, as Percent of Salaries." **Maine:** State of Maine, State & Teachers Retiree Healthcare Plan, "Actuarial Valuation for Fiscal Year 2008/09 GASB 45 Information," June 30, 2008. **Louisiana:** Buck Consultants, "GASB 43/45 Actuarial Valuation at 7/1/2009 of The State of Louisiana Post-Retirement Benefit Plan for the Office of Group Benefits," April 2010. **Milwaukee:** Gabriel, Roeder, Smith & Company, "Milwaukee Public Schools Retiree Health Care and Life Insurance Programs: Actuarial Valuation as of July 1, 2009," June 25, 2010. **Illinois:** Gabriel, Roeder, Smith & Company, "Teachers' Retirement Insurance Program of the State of Illinois: GASB No. 43 Actuarial Valuation Report as of June 30, 2009." **Washington:** Office of the State Actuary, "Washington State 2008 Other Post-Employment Benefits (OPEB) Actuarial Valuation Report," August 2008. **North Carolina:** Aon Consulting, "State of North Carolina Report of the Actuary on the Postemployment Medical Benefits Valuation," December 31, 2005. **Ohio:** Cavanaugh Consulting, "Report on the Retiree Health Care Valuation of the School Employees Retirement System of Ohio: Prepared as of June 30, 2010." **San Francisco:** Memorandum to Mayor Gavin Newsom, Members of the Board of Supervisors, from Ben Rosenfield, Controller, "Report on Retiree (Post-Employment) Medical Benefit Costs," December 15, 2010. **Georgia:** Cavanaugh Consulting, Georgia State Employees Post-Employment Health Benefit Fund & Georgia School Personnel Post-Employment Health Benefit Fund, "Report of the Actuary on the Retiree Medical Valuations: Prepared as of June 30, 2009." **Boston:** The Segal Company, "The City of Boston Actuarial Valuation and Review of Other Post-Employment Benefits (OPEB) as of June 30, 2009." **Connecticut:** Gabriel, Roeder, Smith & Company, "The Report of The Actuarial Valuation as of June 30, 2006 of the Connecticut State Teachers' Retirement System Retiree Health Care Plan." **New Jersey:** Aon Consulting, "State of New Jersey Postemployment Benefits Other Than Pension Actuarial Valuation, July 20, 2010." **Hawaii:** Aon Consulting, "State of Hawaii Postemployment Benefits other than Pensions, July 1, 2007."

54. Melinda Beeuwkes Buntin, José S. Escarce, Kanika Kapur, Jill M. Yegian, and M. Susan Marquis, "Trends and Variability in Individual Insurance Products," *Health Affairs*, September 24, 2003, at <http://content.healthaffairs.org/content/early/2003/09/24/hlthaff.w3.449.full.pdf+html> (September 29, 2011). A similar adjustment is made in Munnell et al., "Comparing Compensation: State-Local Versus Private Sector Workers."

despite the fact that school teachers work a significantly shorter average work year.

The answer to this puzzle lies in a footnote to the BLS data, which states that:

The NCS [National Compensation Survey] uses contract hours for teachers in determining the work schedule. Contracts usually specify the length of the school day, the number of teaching and required nonteaching days, and the amount of time, if any, teachers are required to be in the school before and after school hours. These hours are used to construct the work schedule. For example, it is common for teacher contracts to specify that teachers will work 185 days per year. In these cases, the daily work schedule would be the length of the school day plus any time teachers are required to be in school before or after the school day, and the weekly work schedule would be the daily schedule multiplied by 5 days (Monday through Friday). The number of weeks would be 37 (185 days ÷ 5 days per week). The time not worked during summer, Christmas break, and spring break would be excluded from the work schedule and would not be considered vacation or holiday.<sup>55</sup>

In other words, paid time off reported in BLS data reflects leave only during a 37-week work year and excludes 15 weeks of leave during summers and holidays. To account for shorter work years, we created an additional BLS category called “Work Year Leave” which represents the value of a shorter work year. The baseline value of Work Year Leave equals 15 weeks divided by 52 weeks, or 28.8 percent of salary.

The BLS assumption of a 185-day work year seems reasonable.<sup>56</sup> In some cases, teachers must work both before and after the official school year ends, and indeed some work years are longer than 185 days. Washington, D.C., public schools have 180 student days but 195 total teacher days; likewise, Chicago public schools have 193 teacher days. For the purposes of sensitivity analysis, we also use a longer 195-day work year in

which work year leave equals 13 weeks divided by 52 weeks, or 25 percent of salary.

**Summary of Benefits.** With modifications to retirement income and paid leave, along with the inclusion of retiree health care, a fuller view of non-wage compensation is presented in Table 7. The changes are far from trivial. While the incomplete BLS data imply that benefits for public-school teachers are worth about 41.2 percent of their salaries, a more complete accounting puts the true value at 100.8 percent. Because of retiree health coverage and a small upward adjustment to private-sector DB pensions, private-sector benefits rise to 43.5 percent of salaries.

Even with the lower value for work year leave premised on a 195-day work year, total teacher benefits equal 97 percent of salaries. While including the value of longer paid leave is important, reasonable changes in its value do not result in large changes to measured compensation. In fact, benefits equal 72 percent of salaries—two-thirds larger than for comparable private-sector workers—even when work year leave is excluded entirely.

## THE TEACHER COMPENSATION PREMIUM

We began both the salary and benefits sections by describing how the “standard” measures of teacher compensation are misleading and incomplete. If accepted at face value, they would imply that public-school teachers are highly undercompensated compared to similar private-sector employees. The initial Current Population Survey regression suggested that teachers are underpaid in wages by 19.3 percent, and the incomplete BLS data indicated that teachers receive about the same benefits as a percentage of their salaries as non-teachers in large firms—41.2 percent for teachers versus 41.3 percent for non-teachers.

However, once salaries and benefits are properly measured, public-school teacher compensation is significantly greater. We have shown that public-school teachers are not likely to be underpaid in wages, and they may even enjoy a small wage premium. As a baseline, we assumed that public-school teacher salaries are

55. Richard Schumann, “Work Schedules in the National Compensation Survey,” Bureau of Labor Statistics, July 28, 2008, at <http://www.bls.gov/opub/cwc/cm20080722ar01p1.htm> (September 25, 2011).

56. See, for example, John Forsyth, “Administrator Pay Vs. Teacher Pay,” *The School Administrator*, December 2003, at <http://www.aasa.org/SchoolAdministratorArticle.aspx?id=8932> (September 25, 2011).

in line with market rates—that is, there is neither a salary penalty nor a premium. With that assumption, benefits become the decisive factor. Including benefits, total compensation is 40 percent higher for public-school teachers.<sup>57</sup>

Benefits are so much higher for teachers that they dwarf the impact of salaries. Even if we use the initial, flawed regression estimate of a 19.3 percent salary penalty, teachers would still enjoy a 12.9 percent total compensation premium over similarly qualified private-sector employees.<sup>58</sup>

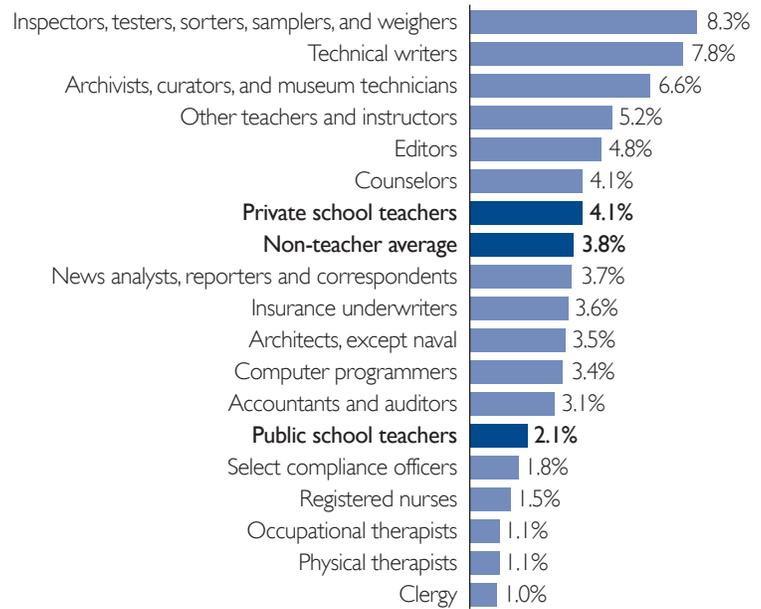
Better data and further research could produce improved wage and benefit estimates, and total teacher compensation will vary from state to state and district to district. Nevertheless, the teacher-compensation premium measured here is not a function of any single adjustment or assumption. No reasonable set of assumptions will produce a teacher compensation penalty, and job security has yet to be considered.

**JOB SECURITY**

Once hired, most public-school teachers face a short probationary period when they may be fired relatively easily. After that, teachers rarely lose their jobs. Anecdotes abound about teachers who stay employed despite obvious misconduct or incompetence. While perhaps an extreme case, New York City maintains the infamous “rubber rooms” where teachers whom the district is attempting to fire are paid to do nothing, as the seemingly endless appeals process grinds on.<sup>59</sup>

During the recent recession and state and local budget crunch, some public-school teachers were indeed laid off. Employment in education by local government

**Average Unemployment Rates for Occupations Comparable to Teaching, 2005–2010**



Source: U.S. Department of Labor, Bureau of Labor Statistics, Office of Publications & Special Studies, Employment & Earnings Online, at <http://www.bls.gov/opub/ee/home.htm%5C> (September 26, 2011).

Chart 1 • CDA 11-03 [heritage.org](http://heritage.org)

declined by 2.9 percent between September 2008 and July 2011, according to BLS data. Nevertheless, these job losses occurred in a period in which overall private-sector employment declined by 4.4 percent.

Relative to the workforce as a whole and to comparable occupations, public-school teachers do appear to be unemployed rather infrequently. Chart 1 shows the average unemployment rates between 2005 and 2010 for public and private teachers, along with several other occupations that have been deemed “comparable” in terms of workload.<sup>60</sup> The unemployment rate for public-school teachers is 2 percentage points lower than

57. Assume that both public-school teachers and private workers earn \$X in salary. Then the ratio of teacher compensation to private compensation is  $(1+1.0077)X / (1+0.4345)X = 2.0077/1.4345 = 1.3996$ , or a 40 percent compensation premium. (Note that we use an extra decimal place of precision in these calculations compared to what appears in the text. For example, we use 100.77 percent of wages as the value of teacher benefits, not the rounded 100.8 percent.)

58. Here, we assume that private-sector workers earn \$X in salary, implying that public-school teachers receive  $(0.807)X$  because of the 19.3 percent salary penalty. Now the compensation ratio is  $(1+1.0077)(0.807X) / (1+0.4345)X = 1.129$ , or a 12.9 percent premium.

59. Steven Brill, “The Rubber Room: The Battle Over New York City’s Worst Teachers,” *The New Yorker*, August 31, 2009, at [http://www.newyorker.com/reporting/2009/08/31/090831fa\\_fact\\_brill](http://www.newyorker.com/reporting/2009/08/31/090831fa_fact_brill) (September 29, 2011).

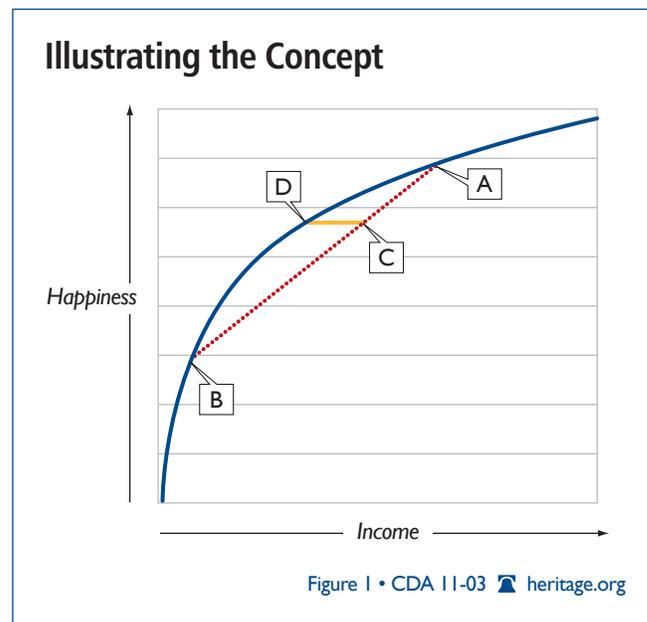
60. The comparable occupations come from Allegretto et al., *How Does Teacher Pay Compare?* p. 21.

for private-school teachers, and 1.7 percentage points lower than the non-teaching average. To the degree that formal educational qualifications overstate the market value of public-school teachers, these figures may understate the level of additional job security enjoyed by teachers.

“Much of the observed public–private difference in unemployment rates is attributable to the ability of unions to promote job security in the public sector,” wrote economist Steven G. Allen in a National Bureau of Economic Research book on government employee unions.<sup>61</sup> Indeed, job security is one of the express goals of teachers’ unions. Job security is especially valuable to employees when it protects against losing a job that already offers higher pay than teachers could otherwise receive. In other words, the value of job security partly depends on the wage and salary premium we found in prior sections.

The public-school system in Washington, D.C., now offers salary increases and bonuses to the best-performing teachers in the city, those in the top 7 percent of performance ratings. However, these pay increases come with one catch—teachers who accept the money must give up some of their job security. Remarkably, 20 percent of the *best* teachers declined this offer, even when they could have increased their base salary by up to \$44,000 per year, equal to a 50 percent salary increase over the standard seniority-based pay scale.<sup>62</sup> Clearly, teachers—like other employees—value job security.<sup>63</sup>

Putting an overall monetary value on job security is not a straightforward task, and academic research has demonstrated that the impact of greater or lesser job security on wages will not be apparent in survey data.<sup>64</sup> However, we have developed a model that gives some conservative estimates.<sup>65</sup> We use a “certainty equivalent,” a guaranteed payment that individuals would find equally attractive compared to a higher but uncertain payment. For example, an individual might be willing to accept a guaranteed payment of \$45,000 in lieu of a



50 percent chance of winning \$100,000. The more risk averse the individual, the lower the certainty equivalent relative to the expected value of the risky payment.

Similarly, we might ask how much salary reduction a private-sector worker would accept to have the job security of a public-school teacher. We begin with the standard assumption that the utility or welfare generated by income will rise as income rises, but at a decreasing rate. Moreover, the rate at which utility declines increases with the risk aversion of the individual. A more risk-averse individual will be willing to accept a lower guaranteed income because the increase in expected utility by accepting a risky job is lower.

The theory may be more understandable with a graphical illustration that appears in some form in most economics textbooks. Figure 1 shows a stylized utility function, where the curved line shows the relationship between income (on the horizontal axis) and utility (on the vertical axis). Higher income generates more happiness, but at an ever-declining rate. Point A represents the income and utility if the individual keeps

61. Steven G. Allen, “Unions and Job Security in the Public Sector,” in Richard B. Freeman and Casey Ichniowski, eds., *When Public Sector Workers Unionize* (Chicago: University of Chicago Press, 1988), at <http://www.nber.org/chapters/c7913.pdf> (September 29, 2011).

62. See District of Columbia Public Schools, “Compensation,” at <http://dcps.dc.gov/DCPS/About+DCPS/Career+Opportunities/Teach+in+Our+Schools/Compensation> (October 21, 2011).

63. Lisa Gartner, “Most Teachers Exchange Security for Salary Increases,” *The Washington Examiner*, September 18, 2011, at <http://washingtonexaminer.com/local/education/2011/09/most-teachers-exchange-security-salary-increases> (September 29, 2011).

64. Hae-shin Hwang, W. Robert Reed, and Carlton Hubbard, “Compensating Wage Differentials and Unobserved Productivity,” *The Journal of Political Economy*, Vol. 100, No. 4 (August 1992), pp. 835–858.

65. For more details, see Biggs and Richwine, “Comparing Federal and Private Sector Compensation,” p. 22.

his job throughout the year, while Point B represents the income and utility should he lose his job. Point C, which lies between the two, represents the individual's expected utility from his employment—that is, the probability-weighted average of the utilities at Points A and B.

Point D lies to the left of Point C and represents the certainty-equivalent income—that is, the compensation with zero probability of discharge that would generate the same utility as the non-guaranteed compensation the individual currently receives. Put another way, the difference between points C and D reflects the pay increase an individual would demand to shift to a job with lesser job security.

Calibrating the model with a difference of 1.7 percentage points in the unemployment rate between public-school teachers and comparable private-sector occupations yields a baseline value of job security equal to an additional 1 percent of pay.<sup>66</sup> A variety of real world examples, including the Washington, D.C., teacher bonuses cited above, indicate that in practice employees value their job security more highly. This may in part be due to psychological costs to job loss, such as the loss of friends made on the job, or the financial costs associated with a job search. These are not considered in our calculations.

In our model, job security becomes even more valuable when it protects a position that pays a wage and benefit premium relative to alternate employment. We have shown in earlier sections that public-school teachers receive wage and benefit compensation approximately 40 percent higher than they would likely receive in alternate private-sector employment. Job security protects this premium. Assuming that a teacher who becomes unemployed finds a new job at a lower, private-sector level of pay yields a job security value of 8.6 percent of compensation. This is essentially the value of lost compensation due to a spell of unemployment added to the difference in compensation between teaching and working at a new, lower-paying job. As noted above, we have not attempted to quantify the psychological or transitional costs of unemployment, which likely make job security even more valuable.

Since greater or lesser job security should generate a “compensating wage differential,” we can apply the value of job security to the wage and benefit premiums already calculated. If the wage and benefit premium totals 40 percent, including a job security premium of 8.6 percent increases total compensation to 52 percent above market rates.<sup>67</sup>

## HOW MUCH SHOULD TEACHERS BE PAID?

Because of the large compensation premium that public-school teachers enjoy, teachers are unlikely to receive better offers elsewhere. Policymakers should evaluate teacher compensation packages in light of this fact, particularly given the serious state and local budgetary shortfalls across the country. Reducing teacher compensation, especially overly generous benefits, could help to balance budgets today and to free up resources in the future. These resources could be put toward classroom materials and school building amenities, spending priorities outside education, tax relief, or all of the above.

More deep-seated reforms of teacher compensation should focus on improving teacher quality. We have shown that *existing* teachers are paid above market rates, but recruiting highly effective teachers into the profession may require present levels of compensation or perhaps even higher levels. The key is restructuring the pay system in a way that attracts and retains the most effective teachers. Unfortunately, most union contracts specify that teachers be paid based on their level of education and their experience rather than their effectiveness. As we have discussed, years of education have little impact on teacher quality, and experience ceases to matter after just a few years on the job. High levels of job security ensure that even poor-performing teachers continue to receive regular raises each year, instead of facing competition from more effective candidates.

Furthermore, union contracts are not easily adaptable to changes in the supply and demand for particular kinds of teachers—gym teachers are often on the same pay scale as math teachers, even when there is a shortage of the latter. Although our analysis shows

66. For the exact model specification used in calculations like these, see *ibid*.

67. Again assume that salaries are \$X for both public-school teachers and private workers. Because job security is worth an additional 8.6 percent of compensation, the teacher-to-private-compensation ratio is now:  $(1+0.086)(1+1.0077)X / (1.4345)X = 1.5199$ , or a 52 percent premium.

that the *average* elementary or secondary teacher is paid substantially more than market levels, data limitations prevent us from being more specific. It could be that calculus teachers are underpaid, while music teachers are overpaid, or *vice versa*. While union contracts help secure overcompensation for the average teacher, they may still leave the most valuable teachers underpaid.

Much greater flexibility is needed. School administrators need to be able to hire and fire teachers as needed, basing personnel decisions on rigorous value-added evaluations and setting pay based on prevailing market rates. Doing so would help attract better applicants who are willing to be judged by their performance. This arrangement, in which employers are empowered to reward their best workers and to terminate their worst, is standard in the private sector.

Under a market-driven pay-for-performance system, teacher compensation will begin to move toward levels matching those of similarly skilled private-sector employees. Whether fundamental reforms of this kind can be implemented within the public-school system is questionable, which makes flexible school models—such as expanded charter school options or vouchers—attractive options that policymakers should consider.

Any reform that allows schools to operate with a less onerous regulatory burden could potentially improve the teacher-compensation system.

## CONCLUSION

After overcoming several methodological challenges to evaluating teacher compensation, it is evident that existing public-school teachers receive wages that are at least as high as comparably skilled workers, while their benefits and job security exceed what they could earn in the private sector. Overall, public-school teacher compensation exceeds private levels by approximately 52 percent, for a total of more than \$120 billion annually in excessive labor costs.<sup>68</sup> State and local governments seeking to balance their budgets in difficult times should take a close look at teacher compensation, which is considerably higher than necessary to retain the existing teacher workforce. More fundamental reform of teacher compensation would scrap the existing rewards for education and experience—and instead pay market rates to teachers who are measurably effective.

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68. This calculation assumes, from the U.S. Census Bureau, 3.2 million elementary and secondary teachers receiving an average salary of \$50,758. See, respectively, Table 250. “Elementary and Secondary Schools—Teachers, Enrollment, and Pupil-Teacher Ratio,” at <http://www.census.gov/compendia/statab/2011/tables/11s0250.xls> (September 29, 2011), and “Back to School: 2010–2011,” U.S. Census Bureau News, June 15, 2010, at [http://www.census.gov/newsroom/releases/pdf/cb10ff-14\\_school.pdf](http://www.census.gov/newsroom/releases/pdf/cb10ff-14_school.pdf) (September 29, 2011).