

Teacher Compensation

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Introduction

In the last twenty years, a large body of empirical evidence has revealed that teachers are a major input for student learning.^{1,2} Attracting and retaining effective educators is, thus, one of the most effective ways for school leaders to deliver high-quality education to all students. However, effective teachers continue to be scarce, particularly for schools serving larger shares of socioeconomically disadvantaged students. In most labor markets, the main tool that employers use to attract and retain employees is pay. It is perhaps only natural that teacher pay has long been at the center of a heated policy debate, which is still open.

There are two main reasons why teacher salaries have remained such a contentious topic. The first is that, in most developed countries, teacher pay depends on seniority and is not connected to performance. In the U.S., for example, the majority of states and districts use “step-and-lanes” salary schedules, i.e., tables that determine a teacher’s pay as a function of her seniority (which determines the “step”) and her academic credentials (for example, attainment of a master’s degree, which determines the teacher’s “lane”).³ While this feature of teacher compensation may appear attractive to some teachers because it leaves little uncertainty over wage growth, it also implies that employers (i.e., schools or districts) have almost no freedom to adjust pay at the individual teacher level and typically cannot use pay as a lever to attract and retain their most desired employees.

The second reason for the heated discussions over teacher pay is that teachers earn much less than other similarly educated professionals. For example, in 2022, employed individuals who work as K-12 public-school teachers made 26.4% less than other college-educated workers across the U.S.⁴ In contrast to other categories of workers, though, teachers typically enjoy generous retirement benefits in the form of pensions. This implies that teachers’ lifetime compensation tends to be shifted to later in life, with possible implications for the selection and retention of various types of employees.

The debate over teacher compensation has translated into various attempts to reform how teachers are paid. During the 2000s, several U.S. school districts and school systems in other countries have experimented with various forms of performance pay. These programs, though, have delivered mixed results and have typically not worked in the United States. If anything, these failed attempts to boost teacher performance with monetary incentives—particularly in comparison to more successful stories in other countries—have emphasized the need to properly design compensation and nonmonetary incentives, taking into account the institutional landscape in which public schools operate.

Key findings

Key finding #1: *The supply of talent in public schools depends (also) on how generous teacher compensation is vis à vis workers' outside options.*

More effective teachers enter the teaching profession during economic downturns (when alternative jobs are scarcer and lower paying) than during expansions. When school districts can (and do) offer individually adjusted pay and can afford to pay highly effective teachers more, they manage to attract precisely these types of workers into their schools.

Key finding #2: *Performance pay, if properly designed, improves teacher performance on average, but the effects vary widely, and program design matters.*

Some of the programs implemented in the U.S., particularly in unionized contexts in which teachers lacked agency, failed to produce effects on students. Program implemented in different contexts (particularly in developing countries) and designed to ensure teachers would be compensated on outcomes they could affect instead significantly increased student achievement.

Key finding #3: *Giving employers (i.e., school districts) flexibility in the design of individual teacher compensation can improve selection, retention, and effort. However, it may lead to inequalities among teachers (in terms of pay, to an extent that is unrelated to quality) and among students.*

In Wisconsin, where school districts acquired the flexibility to adjust teacher pay individually, districts that used this flexibility to pay better teachers more improved the effectiveness of their teaching body. However, individual wage negotiations led women to be paid less than men, and more disadvantaged districts benefited less from flexible pay because of differences in budgets and in their overall desirability from the teacher's standpoint.

Key finding #4: *Despite the generosity of teacher pensions relative to salaries, teachers do not seem to value pensions as much as they value salaries.*

When given the possibility of purchasing additional pension wealth, teachers are willing to pay only 20 cents for each additional pension dollar. In addition, cuts to salaries appear to generate much larger responses (in terms of attrition and early retirement) than cuts to pension benefits and wealth.

Open areas of research

We still know very little about whether changes in teacher compensation can be a powerful tool to convince college graduates to pick teaching as a long-term career. Evidence suggests that recent teacher reforms (such as the introduction of evaluation systems or reductions in the powers of public-sector unions) may have lowered the number of people who apply for teaching licenses.⁵ We have more scant credible evidence on the possible causal role of salaries.

Evidence

Key finding #1. *The supply of talent in public schools depends (also) on how generous teacher compensation is vis à vis workers' outside options.*

At the core of the debate over teacher compensation lies the question of how (if at all) teachers react to monetary incentives. Providing a rigorous answer to this question is not easy. To learn about these responses, the perfect experiment would randomly (and significantly) vary the pay of a group of teachers and subsequently measure how these “treated” teachers responded in terms of attrition and performance relative to teachers whose pay was not changed.

For obvious reasons, such a pay experiment is virtually impossible to conduct in reality in a context such as the U.S. In many school districts, salaries of public-sector employees are regulated by union contracts or, in nonunionized districts, by detailed employee handbooks, and individual bonuses—especially if allocated at random—are not very common. As a second-best alternative, earlier studies have examined the relationship between people’s propensity to choose teaching as a profession and salaries in teaching relative to other occupations as well as how teachers move across school districts and, in particular, whether they tend to move to districts that pay more. While the former group of studies has found a relationship between starting salaries and the propensity to become teachers,^{6,7,8,9,10} the second group has generally found that teachers do not move across districts to obtain higher pay – a conclusion that has prompted scholars to conclude that teachers do not care about money.¹¹ However, one must keep in mind that pay differences across districts for teachers with similar seniority and education—particularly if those districts are part of the same state or even commuting zone, as the origin and destination districts of teachers who move tend to be—are usually small,¹² so there is not much to be gained from moving to begin with.

In the absence of significant pay variation across job options for teachers, how can researchers study teachers’ responses to monetary incentives? A clever approach proposed by a recent paper uses recessions to achieve this goal. This study examined whether teachers who start their career during recessions (i.e., when labor markets are weak and alternative job options are scarcer and lower paying) differ from those who start during economic expansions in terms of teaching effectiveness.¹³ The idea behind the researchers’ hypothesis is simple yet powerful: Since employment and hiring in public-school teaching is (for the most part) insensitive to the business cycle and most jobs for college-educated workers pay more than teaching, if teachers care about money, then economic downturns should draw into teaching some of them who would not have considered this career under better economic conditions and would have chosen a better outside option instead. To establish how the selection of teachers relates to the state of the economy, the authors compare teachers by their value added, i.e., their individual impact on the growth in student achievement after observable differences among students are accounted for. While an imperfect measure of teacher effectiveness, value added has been shown to be associated with better student outcomes in both the medium and the long term.¹⁴ Note also that having a measure of teacher effectiveness is a rare feature of empirical studies on selection into teaching.

These studies generally compare people who become teachers with people who do not, and measures of teaching effectiveness are obviously unavailable for those who choose not to teach.

Implementing this comparison with data from the U.S. state of Florida, including the employment records of over 30,000 public-school teachers and the test scores of the students they teach, the authors of the aforementioned study show that teachers who enter the profession during recessions have higher value added than those who enter during expansions. These differences are important in magnitude. Given existing estimates of the impact of high-value-added teachers,¹⁵ the difference in average math effectiveness between recession and nonrecession entrants is equivalent to a difference in students' discounted lifetime earnings of approximately \$13,000 per classroom taught in each year.

A possible explanation for this finding is that teachers who enter during a recession are less likely to leave and, thus, achieve higher value added over time because of learning. However, this mechanism appears unlikely to explain the results. Taken together, the findings of this study indicate that the monetary aspect of the teaching job, especially in comparison to the next-best alternative option, is indeed an important determinant of young workers' decision to become (and remain) a teacher. Teachers thus appear to respond to monetary incentives, at least when deciding whether to become a teacher.

While teacher pay has historically been rather uniform across districts within the same state (and largely also across states), recent changes to district pay practices resulting from changes in the laws that regulate collective bargaining have offered an additional opportunity to examine whether pay can attract teachers to and retain them in a job. One such change is Wisconsin's Act 10, a 2011 law that granted school districts the ability to adjust pay at the individual teacher level and to offer bonuses to teachers employed elsewhere to attract them to the district. In a 2021 study, I use post-Act 10 employee handbooks to determine whether each school district used individual (or "flexible") pay or continued paying teachers based only on seniority and academic credentials. I then study the movements of different teachers across these two different groups of districts. I find that flexible-pay districts managed to attract high-value-added teachers at a much higher rate after the reform than before and in comparison to seniority-pay districts.¹² This result provides additional evidence that pay can be a powerful tool to attract effective teachers to and retain them in the schools where they are needed most.

Key finding #2: *Performance pay, if properly designed, improves teacher performance on average, but the effects vary widely, and program design matters.*

Since teachers appear to respond to monetary incentives, a natural next question is how to design teacher pay to attract talent to the profession and motivate existing teachers to promote learning for all students. Performance pay—for example, bonus pay connected to measures of effectiveness—is often proposed as a tool to achieve this goal. However, it is a controversial policy. Its proponents lament the lack of any connection between effectiveness and monetary rewards in the current system. Its opponents argue that only some of the many tasks of a teaching job can be measured and that tying these to pay may distort teachers' efforts in undesirable ways (for example, leading teachers to spend most of their time teaching students how to crack a standardized test rather than ensuring that they understand the material).¹⁶

Opponents also worry that paying teachers based on performance may be detrimental for morale and be politically difficult to sustain in public schools, in some cases because of opposition from teachers' unions.

The evidence on the effects of performance pay on teacher behavior and student learning is mixed. Studies on settings outside the U.S., especially developing countries, have highlighted positive effects.^{17,18} In contrast, the experience of various school systems within the U.S. has been more varied, with some success stories¹⁹ but other programs failing to deliver significant effects on student outcomes.²⁰ A recent metanalysis finds an overall positive impact of performance pay on student test scores among 26 U.S.-based studies; yet the findings highlight how program impacts can vary dramatically even within the same country depending on how each policy is designed and implemented.²¹

One of the margins along which programs in the U.S. and elsewhere differ is the assignment of performance bonuses to teachers. One can perhaps see this divergence best by contrasting two studies of teacher performance pay: one carried out in Andhra Pradesh (India) that shows positive effects on students and one in New York City (NYC) public schools that shows no effects.

The India study evaluates a large-scale teacher performance-pay program, implemented in two distinct ways across two treatment groups. The first group received an individual bonus distributed to teachers whose students gained at least 5% in terms of test scores. The actual size of the bonus for each teacher was a linear function of the student test score gains; the bonus was equal to 3% for the average teacher. Compared to a bonus formula that compensates teachers above a score gain threshold, this formula minimizes the risk that teachers would focus only on students close to the threshold. Student gains were measured in exams administered by external evaluators to mitigate the risk of cheating. The second treatment group received a group-based bonus, with a formula identical to the individual bonus but calculated on the basis of school-level gains (so that all teachers in a school would receive the same bonus). A comparison of the teachers in treated and untreated schools reveals large and positive effects of performance pay on all students in the short run in both incentivized and nonincentivized subjects. In the medium run, individual incentives were more effective than group incentives.

The NYC study examines a randomly allocated school-based incentive program designed by the NYC Department of Education (DOE) and the United Federation of Teachers (NYC's teachers' union). The bonus was allocated to approximately 200 schools and 20,000 teachers. Each school could earn \$3,000 per teacher and distribute the amount across teachers at its own discretion. To be eligible to receive the bonus, the school had to meet a performance target, set by the DOE and based on a combination of standardized test score growth, attendance, graduation rates (for high schools), and measures of school environment obtained through surveys of all school stakeholders (including parents). The program was unsuccessful. Student achievement did not change (if anything, it declined). Other measures of student success, such as attendance and graduation rates, were also unaffected.

While the Andhra Pradesh and the NYC programs are just two of many, comparing (and contrasting) their features is helpful to understand when performance pay may work and when it may fail. In Andhra Pradesh, the bonus was sizable, linked to outcome measures that teachers understood but could not manipulate, and directly

proportional to effectiveness (and thus effort). In some schools (and the ones with the largest impacts), it was also individually based, giving teachers even more control over the relationship between effort and reward. In NYC, teachers probably lacked a similar sense of agency. Complicated and composite outcome measures may have introduced significant uncertainty on the relationship between effort and improvements. A threshold formula may have led some teachers to not even attempt to change their behavior if they perceived the threshold to be either too low (and therefore not binding) or too high (and therefore unattainable).

The very different outcomes of these two programs highlight how the design of performance pay is crucial to its effectiveness in promoting student learning. Teacher agency and nonmanipulable measures²² appear essential for success. The environment matters, as well. While in Andhra Pradesh teachers largely supported the program, the strong union presence in NYC may have generated backlash against any program with powerful incentives and contributed to its being designed in a way that failed to incentivize teachers.

While the two studies mentioned above focus on the direct impact of performance pay on student outcomes via increased teacher effort, there may be other ways in which financial incentives impact students, particularly if these incentives are long lived.²³ First, they may lead teachers to invest in building stronger teaching skills. Second, they may draw a different set of people into the profession, i.e., people who may be abler or more willing to benefit from the specific reward system in place.²⁴ The extent to which these two mechanisms have power, though, is ultimately an empirical question on which more evidence is needed.

Key finding #3: *Giving employers (i.e., school districts) flexibility in the design of individual teacher compensation can improve selection, retention, and effort. However, it may lead to inequalities among teachers (in terms of pay, to an extent that is unrelated to quality) and among students.*

The strong presence of teacher unions across some U.S. public school systems and, more generally, the use of salary schedules has led the distribution of teacher pay to be quite compressed. In most school districts, teachers are simply paid based on their seniority and academic credentials. This implies that district administrators have little to no discretion to implement pay adjustments at the individual teacher level—for example, to attract and retain effective teachers.

This way of paying teachers, though, has come under scrutiny in recent years, with proposals for a pay-setting process that gives more flexibility to school districts to adjust compensation to meet their hiring needs. This proposal became reality in the state of Wisconsin in 2011, when the state legislature dramatically reformed pay and benefits of public-sector employees—and particularly teachers—with the passage of a law known as Act 10. This piece of legislation, technically a budget repair bill, significantly reduced the powers of public-sector unions. In particular, it prohibited them from engaging in negotiations over salary schedules (although they can still negotiate base pay). The end of collective bargaining over salary schedules implied that, post-Act 10 and upon the expiration of their existing collective-bargaining agreements (CBAs), Wisconsin districts acquired the flexibility to set teacher pay however they saw fit and to adjust it at the individual level.

The experience of Wisconsin can inform how giving school districts discretion over teacher pay—as opposed to its simply being determined by a salary schedule—affects teacher pay, movements across districts, and exit. I investigate this in a recent article.¹² Using information from districts' employee handbooks, I show that, by 2015, approximately half of all districts had moved to a flexible-pay regime and the remaining ones were still using a salary schedule.

I then study how post-Act 10 teacher pay differed between these two groups of districts. Salaries became correlated with value added in flexible-pay districts (but not in seniority-pay districts) after Act 10 and after the expiration of their preexisting CBAs (but not before). Given that, during the period of study (2006–2016), Wisconsin districts neither calculated teacher value added nor used it to evaluate teachers, these results demonstrate that school districts can recognize effective teachers and some districts are willing to pay them more when pay is flexible.

I also find that the introduction of flexible pay changed the composition of the teaching workforce: It led more effective (and, in some cases, younger) teachers to move from seniority-pay to flexible-pay districts, where they would be able to enjoy higher pay. Less effective teachers instead left flexible-pay districts at a higher rate post-Act 10, and they either joined other districts within the state or left the profession altogether. As a result, the average value added of teachers in flexible-pay districts increased relative to that in seniority-pay districts, with obvious consequences for student achievement.

These findings indicate that flexible pay can be a helpful tool for districts to attract and retain high-quality teachers. However, flexible pay is not without harm. The existence of individual pay adjustments opens the possibility for individual bargaining between districts and teachers, which may lead certain employees to obtain higher pay for reasons unrelated to their effectiveness. Indeed, in the aftermath of Act 10, a gender pay gap emerged among otherwise identical male and female teachers in Wisconsin because of women's reluctance to bargain over their pay.²⁵ In addition, differences across districts in resources per pupil and in their ability to attract teachers based on nonmonetary aspects of the job (for example, composition of the student body) implied that flexible pay ended up disproportionately benefitting districts serving more advantaged students.²⁶ Taken together, these results highlight once more how the design of flexible pay and the actual incentives it creates—which may very well be context specific and related, for example, to the characteristics of teachers and students within a school system—are crucial determinants of its success in attracting, retaining, and motivating educators.

Key finding #4: *Despite the generosity of teacher pensions relative to salaries, teachers do not seem to value pensions as much as they value salaries.*

Similarly to this chapter, the debate over teacher compensation has largely focused on teacher salaries. A sometimes less appreciated feature of teachers' lifetime compensation is that it is considerably more backloaded than that of other professions. Although teachers tend to be paid less than other professionals, most of them enjoy very generous pensions upon retirement through plans run by states and with retirement rates reaching 80% in some cases.²⁷ In the majority of U.S. states, teachers contribute very little toward these pensions, which end up being paid primarily by their employers (i.e., states or school districts). The generosity of these pension plans and the way they are funded have led states to face enormous liabilities,

which are currently unfunded in all but two states.²⁸ Given how generous these plans are relative to salaries and how onerous they end up being, a natural question is whether they are a worthwhile personnel tool. In other words, does offering these plans make the teaching profession more attractive to prospective and incumbent teachers, or would it make more sense to lower pensions and raise salaries instead? The answer to this question depends crucially on how teachers value these benefits, particularly against the option of more generous salaries.

The limited evidence seems to indicate that teachers do not value pensions very much. For example, in 1998, Illinois public-school teachers were given the opportunity to increase the rate of accrual of their pensions for past years of service—or, in simpler words, to purchase additional pension benefits—at a one-time fee that depended on seniority and salary. A comparison of the purchasing behavior of teachers who faced different prices indicates that teachers were, on average, willing to pay only 20 cents per additional dollar of pension wealth.²⁹

The behavior of Illinois teachers, though, could be consistent with a few explanations that do not necessarily imply that teachers are not sensitive to compensation changes. For example, teachers may have perceived their initial level of pension benefits to be adequate, given that the benefits were already rather generous. If this is the case, it is possible that the reaction to a cut in pension benefits (rather than an increase) may not be symmetric with that to a possible increase. The Illinois context also makes it difficult to directly compare responses (for example, in terms of labor supply) to changes in salaries and pensions.

To fill this gap, in a recent working paper, I use the variation in salaries and pension benefits generated by Wisconsin's Act 10 (a reform summarized above) to estimate the elasticity of labor supply (and more specifically retirement) to changes in these two forms of compensation.³⁰ This is possible because, upon the passage of Act 10 in 2011, teachers became required to contribute approximately 6% of their pay toward their pensions (before the reform, they contributed 0%). This mandate was essentially equivalent to the levy of a payroll tax or a cut in take-home pay of 6% for active teachers. Additionally, when each district's CBA expired (which occurred between 2011 and 2016, depending on the district), district administrators acquired the flexibility to not pay teachers according to a seniority-based salary schedule. This resulted in several high-seniority teachers (i.e., those already eligible to retire, which in Wisconsin is possible upon reaching 55 years of age and 5 years of seniority) experiencing zero or even negative wage growth, with negative impacts on their future pension benefits (which are calculated as a function of the most recent salaries). The two staggered changes in salaries and pension benefits—which occurred at different points in time—make it possible to examine teachers' retirement behavior upon their experience of each change and to back out the extent to which they respond to cuts in each form of compensation. This exercise reveals that, at least along the substitution margin, teachers are much more sensitive to changes in salaries than to changes in pensions. This result appears to be due, at least in part, to a lack of salience or information on how pension benefits and wealth accrue.

Taken together, the empirical evidence on the use of pensions as a form of compensation suggests that it may be ineffective in attracting and retaining effective teachers to the profession. Higher salaries—possibly with a component that depends on teachers' effectiveness and provides powerful incentives to exert effort—seem to be a better tool to ensure that we attract the most effective teachers.

The road ahead

This chapter demonstrates that teacher pay can be a powerful tool to attract and retain talent in our public schools. Its design, though, is crucial. However, despite the large body of evidence on the topic only in part reviewed here, there is still much that we do not know. One of the greater questions that remains open is whether systemic shifts in teacher compensation—not just in levels, but in the entire structure of it—can induce a larger/different set of people to choose teaching as a career. As with many education related policies, the design of teacher pay tends to be a controversial (and often partisan) issue, and the political feasibility of policy change is far from guaranteed. More rigorous studies of how to make such reforms feasible and successful from a political standpoint would represent a substantial advancement on what we currently know regarding teachers' pay.

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