

Reforming Educator Compensation

By Michael Podgursky

EXECUTIVE SUMMARY

While compensation accounts for roughly 90 percent of K-12 instructional costs, there is little evidence of efficient or strategic design in these systems. Rigid salary schedules reward factors generally unrelated to effectiveness, induce field shortages, and encourage inequitable allocation of professional staff. Deferred compensation systems impose sharp penalties on mobility, promote early retirement and generate large unfunded liabilities. Serious attempts to bring greater efficiencies to K-12 spending and raising teacher quality must confront the dysfunctional compensation system.

1. INTRODUCTION

During the 2012-13 school year, the most current year for which national data are available, U.S. public schools spent \$218 billion for salaries and \$84 billion for benefits for instructional personnel. These compensation payments accounted for 56 percent of K-12 current expenditures and 90 percent of instructional expenditures (U.S. Department of Education, 2016). As large as these expenditures are, they do not fully capture the resources committed to K-12 compensation. They do not, for example, include hundreds of billions of dollars of unfunded liabilities of pension funds and retiree health insurance for teachers and administrators (Rauh, 2017).

Since compensation costs for teachers consumes such a large share of the K-12 education dollar, even small gains in productivity can

have substantial effects on overall costs or performance. In this essay I argue that there is ample reason to believe that substantial efficiency gains can be found, where we define efficiency as improvements in educational output – variously measured as total students served, graduation rates, test performance – per dollar of spending.

Educator compensation “systems” are not rationally planned nor are they integrated in any systematic or strategic way. In any well-run organization, the total compensation package – salaries, current and deferred benefits – should be structured with an eye toward overall firm performance. Tradeoffs between different types of salaries and benefits would be carefully scrutinized. Not only the level, but the structure of salaries would take account of market benchmarks—what others are being paid for comparable jobs—and productivity. In public education, however, teacher compensation packages arise not out of a rational planning process, but rather from an amalgam of different components or “silos.” This silos reflect pressures from different constituencies, legislative mandates, legacies from earlier vintages of collective bargaining agreements, and other institutional and political factors. More importantly, they too often arise with little or no consideration for overall efficiency.

In general, teacher pay is largely set by salary schedules that have evolved over decades of collective bargaining agreements or, in many non-bargaining states, legislative fiat. Base pay is augmented by various



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CEE Policy Series
Number 29
2018

types of district or state-wide salary supplements (e.g., coaching, career ladder). Deferred compensation in the form of retirement pay inhabits another silo altogether, with policy set by statewide pension boards often dominated by senior educators and administrators. Teacher compensation is the sum of all of these parts, plus fringe benefits, such as health insurance, which typically negotiated at the district level.

The purpose of this paper is to identify several key inefficiencies of the teacher compensation system and suggests some principles for reform. To accomplish this, the paper is set out as follows. In section 2 we examine national and Missouri trends in school staffing. Sections 3-5 focus on the structure of teacher compensation in terms of salary, wage-setting units, and retirement benefits. Concluding remarks are found in Section 6. With an eye toward the conditions in Missouri, our survey of the teacher compensation suggests that market-based reforms of teacher compensation would increase efficiency of K-12 spending and improve school performance.¹

2. TEACHER QUALITY VERSUS TEACHER QUANTITY

One common response to discussions of justifying teacher compensation reform is that the level rather than the structure of pay is the problem. In this view, teachers as a group are “underpaid” and that is the primary problem to be fixed. Advocates of this view usually point to salaries in other occupations (rather than teacher salaries in private K-12 schools) in making this case. Allegreto,

Corcoran, and Mishel, (2004), for example, compare teachers to other professionals such as lawyers, nurses, or managers.

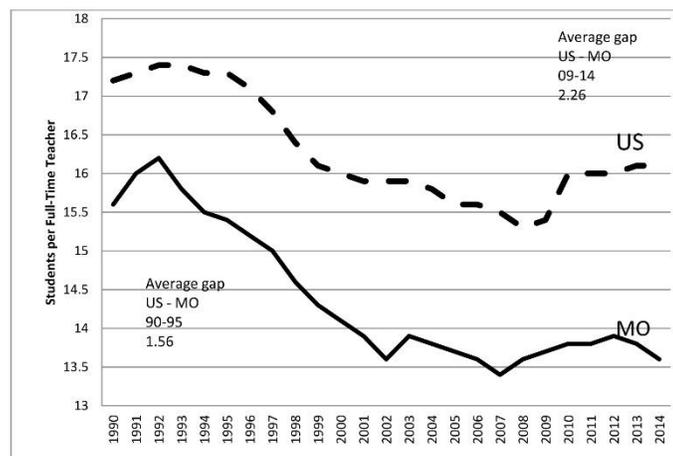
Comparisons of public school teacher pay to non-teacher pay are fraught with difficulties, however. The most obvious one is that teachers have a shorter work day and work year compared to those other occupations. Teachers also have a larger share of pay in the form of benefits; in particular, teachers generally enjoy very generous health insurance and retirement benefits. The most careful study to date comparing public school teachers to non-teachers finds that that the generous benefit package for teachers (which we will discuss further below), readily trumps salary differentials for comparably educated private-sector workers. The result is that public school teachers as a group enjoy a total level of salary and benefits that easily matches or exceeds similarly educated private sector employees (Richwine and Biggs, 2011).

The relevant point for this paper is that the level of average teacher pay

is determined by the decisions of school administrators, who through their actions seem to favor more rather than better remunerated teachers. Figures 1 and 2 illustrate this point. In Figure 1 we report the student-teacher ratio in the United States and in Missouri between 1990 and the present. Both curves show a general downward trend, one that occurred for decades prior to 1990 (Podgursky, 2010; Hanushek, 1986). There is a notable uptick during the recent recession. Figure 2 reports the ratio of students to total school staff (i.e., teachers, counselors, administrators, and non-professional staff) in the United States and Missouri. Again, the trend is downward, with Missouri schools employing more staff per student than the national average. In the most recent available data, Missouri public schools had 7.2 students per full time equivalent (FTE) staff on the payroll, compared with 7.9 in 1990.

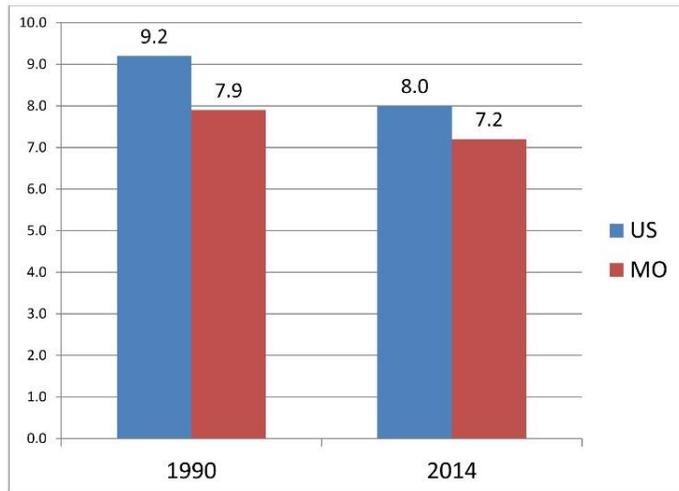
The tradeoff between staff and pay is straightforward. Since 1990, Missouri operating spending per student grew by 126 percent, or 3.6

Figure 1
Student Enrollment, Teacher and Non-Teacher Employment in U.S. Public Schools:
Fall, 1980 to Fall, 2009.



Source: U.S. Department of Education. National Center on Education Statistics. Digest of Education Statistics. Various years

Figure 2
Ratio of Students to Full-Time Staff in Public Schools



Source: U.S. Department of Education, National Center on Education Statistics, *Digest of Education Statistics*, Various years

percent annually. By contrast, over the same period, teacher salaries grew by only 65 percent (2.2 percent annually), from \$28,286 to \$46,750 (Table 1). When spending per student rises by a given amount, say five percent, other things being equal, school administrators face three possible reactions: They can raise teacher pay by five percent and hold staffing ratios constant; they can hold teacher pay constant and lower staffing ratios by five percent; or any combination of the two that adds up to five percent. If Missouri schools had maintained the (already low) staffing ratios of 1990 and devoted the rising revenue per student to teacher salaries, average

teacher pay in Missouri would have been \$64,045, or 37 percent higher.

Further, if Missouri schools took the additional step of raising the Missouri student-teacher ratio to the US average, teacher pay would rise an additional 23 percent off of the 2013 base to \$74,719. Surveying behavior over recent decades, and in spite of much public discourse about “teacher quality,” it’s clear that Missouri school administrators favored a policy of increasing the number of teachers they employ over improving teacher compensation and, one would assume, the potential to improve teacher quality that goes along with

higher pay. In this regard there is nothing unique about Missouri: A too similar quantity-over-quality story holds nationally as well.

There are a variety of competing scholarly hypotheses about why schools made this choice. Some have argued that this reflects consumer preferences for smaller classes (Flyer and Rosen, 1997). There is some research suggesting that smaller class sizes can improve student learning outcomes, however, there is a great deal of slippage between class size and student-teacher ratios.² Others point to union preferences for overstaffing (Ehrenberg and Smith, 1991). The opportunity cost of this strategy, as pointed out by current research on teacher value-added, is that many teachers with low classroom effectiveness have been drawn into public school classrooms. If schools shed the least effective teachers and modestly increased class size, it would be possible to raise the pay of the remaining teachers and increase overall workforce effectiveness (Hanushek, 2009).

3. WHAT PUBLIC SCHOOLS REWARD: THE SINGLE SALARY SCHEDULE AND ITS CONSEQUENCES

Whether the average teacher salary is \$47,000 or \$75,000, the question remains: What factors are rewarded in entry-level salaries and over a teaching career? The answer, unfortunately, is that both entry and career salaries are driven by rigid salary schedules that are not market-based. These salary schedules—usually referred to as “single salary schedules”—are a nearly universal feature of public school districts. Pay for teachers (and principals) in public school districts is largely determined by these schedules. In

Table 1
Missouri Teacher Salaries Over Time: Actual and Potential

Average MO Teacher Salary		Index
1990	\$28,286	---
2013	\$46,750	100.0
2013 with 1990 staffing ratio	\$64,045	137.0
2013 with 1990 staffing ratio and US student-teacher ratio	\$74,719	159.8

Source: U.S. Department of Education, *Digest of Education Statistics*, Various issues. See text.

large school districts the pay of thousands of teachers in hundreds of schools—from kindergarten up to secondary teachers in math and science—is set by a single district-wide schedule. The use of such district-wide schedules is nearly universal in public school districts. The U.S. Department of Education reports that 96 percent of public school districts accounting for nearly 100 percent of teachers report use of a salary schedule (Podgursky, 2007). Comparable survey data are not available for principals, but even a casual inspection of school district web sites suggests that they are ubiquitous for school leaders as well.³

To illustrate such a salary schedule,

Table 2 provides an example, one based on that used for Saint Louis public school teachers. The rows and columns refer to years of experience and levels of teacher education, respectively. Note that the pay increases associated with higher levels of education may be for training not directly associated with a teacher’s actual classroom assignments. For example, it is common for teachers to earn additional remuneration for graduate credits and degrees in education administration while they are still employed full time as classroom teachers. Nearly all other school districts in Missouri and nationwide employ such schedules.⁴

These teacher salary schedules are sometimes referred to as “single

salary schedules,” a term reflecting their historical development as an elementary and secondary school pay scheme (Kershaw and McKean, 1962). Since elementary school teachers were nearly all women whereas high school teachers were mostly male, early struggles for a single salary schedule were seen by some as an important part of feminist struggle for pay equity (Murphy, 1990). The eventual unification of schedules for elementary and secondary school teachers was embraced by the National Education Association and the American Federation of Teachers. Once a unified front was established, such schedules were embedded in nearly every collective bargaining agreement and, in some cases, state legislation.

Table 2: Saint Louis Public Schools Salary Schedule: 2016-2017

St. Louis Public Schools (SLPS)
2016-2017 Teacher Salary Scale

	BA	Bi-Weekly	BA + 15	Bi-Weekly	MA	Bi-Weekly	MA + 15	Bi-Weekly	MA + 30	Bi-Weekly	PHD	Bi-Weekly
A	\$ 39,015.00	\$ 1,857.86	\$ 39,223.08	\$ 1,867.77	\$ 41,616.00	\$ 1,981.71	\$ 43,488.72	\$ 2,070.89	\$ 46,089.72	\$ 2,194.75	\$ 48,378.60	\$ 2,303.74
B	\$ 40,055.40	\$ 1,907.40	\$ 40,159.44	\$ 1,912.35	\$ 42,136.20	\$ 2,006.49	\$ 44,321.04	\$ 2,110.53	\$ 46,818.00	\$ 2,229.43	\$ 49,523.04	\$ 2,358.24
C	\$ 40,575.60	\$ 1,932.17	\$ 41,616.00	\$ 1,981.71	\$ 43,152.67	\$ 2,054.89	\$ 45,339.59	\$ 2,159.03	\$ 47,526.51	\$ 2,263.17	\$ 49,845.56	\$ 2,373.60
D	\$ 40,991.76	\$ 1,951.99	\$ 42,730.27	\$ 2,034.77	\$ 44,737.20	\$ 2,130.34	\$ 47,034.40	\$ 2,239.73	\$ 49,332.65	\$ 2,349.17	\$ 51,787.99	\$ 2,466.09
E	\$ 41,775.12	\$ 1,989.29	\$ 44,087.99	\$ 2,099.43	\$ 46,401.84	\$ 2,209.61	\$ 48,742.74	\$ 2,321.08	\$ 51,085.72	\$ 2,432.65	\$ 53,670.07	\$ 2,555.72
F	\$ 43,738.42	\$ 2,082.78	\$ 45,920.13	\$ 2,186.67	\$ 48,102.89	\$ 2,290.61	\$ 50,582.17	\$ 2,408.67	\$ 53,062.48	\$ 2,526.78	\$ 55,669.72	\$ 2,650.94
G	\$ 45,223.07	\$ 2,153.48	\$ 47,621.19	\$ 2,267.68	\$ 50,019.31	\$ 2,381.87	\$ 52,502.75	\$ 2,500.13	\$ 54,987.22	\$ 2,618.44	\$ 57,622.55	\$ 2,743.93
H	\$ 46,579.75	\$ 2,218.08	\$ 49,190.11	\$ 2,342.39	\$ 51,941.97	\$ 2,473.43	\$ 54,408.76	\$ 2,590.89	\$ 56,878.67	\$ 2,708.51	\$ 59,634.69	\$ 2,839.75
I	\$ 47,978.05	\$ 2,284.67	\$ 50,616.50	\$ 2,410.31	\$ 53,851.10	\$ 2,564.34	\$ 56,328.30	\$ 2,682.30	\$ 58,808.61	\$ 2,800.41	\$ 61,827.85	\$ 2,944.18
J	\$ 49,273.34	\$ 2,346.35	\$ 51,817.12	\$ 2,467.48	\$ 55,661.40	\$ 2,650.54	\$ 58,220.78	\$ 2,772.42	\$ 60,779.13	\$ 2,894.24	\$ 63,988.76	\$ 3,047.08
K	\$ 52,392.46	\$ 2,494.88	\$ 53,372.52	\$ 2,541.55	\$ 57,669.37	\$ 2,746.16	\$ 60,230.84	\$ 2,868.14	\$ 62,794.38	\$ 2,990.21	\$ 66,163.20	\$ 3,150.63
L	\$ 57,815.03	\$ 2,753.10	\$ 57,950.28	\$ 2,759.54	\$ 59,867.74	\$ 2,850.84	\$ 62,464.58	\$ 2,974.50	\$ 65,061.41	\$ 3,098.16	\$ 68,374.05	\$ 3,255.91
M			<i>Only Teachers Hired</i>		\$ 61,727.97	\$ 2,939.43	\$ 64,479.83	\$ 3,070.47	\$ 67,231.69	\$ 3,201.51	\$ 70,704.54	\$ 3,366.88
N			<i>BEFORE July 1, 2009 are</i>		\$ 64,135.46	\$ 3,054.07	\$ 67,304.52	\$ 3,204.98	\$ 70,472.53	\$ 3,355.83	\$ 72,878.98	\$ 3,470.43
O			<i>eligible for the</i>		\$ 66,060.20	\$ 3,145.72	\$ 69,321.85	\$ 3,301.04	\$ 72,668.82	\$ 3,460.42	\$ 75,065.90	\$ 3,574.57
P			<i>BA + 15 Level</i>		\$ 67,953.73	\$ 3,235.89	\$ 71,522.30	\$ 3,405.82	\$ 75,106.48	\$ 3,576.50	\$ 75,293.75	\$ 3,585.42
Q					\$ 73,025.68	\$ 3,477.41	\$ 77,171.67	\$ 3,674.84	\$ 78,950.75	\$ 3,759.56	\$ 77,941.57	\$ 3,711.50
R									\$ 81,319.74	\$ 3,872.37	\$ 81,910.69	\$ 3,900.51
S									\$ 83,758.44	\$ 3,988.50	\$ 83,549.32	\$ 3,978.54
T									\$ 83,758.44	\$ 3,988.50	\$ 84,367.08	\$ 4,017.48
U									\$ 84,381.64	\$ 4,018.17	\$ 85,922.47	\$ 4,091.55
V									\$ 84,669.83	\$ 4,031.90	\$ 86,639.31	\$ 4,125.68
W									\$ 85,325.28	\$ 4,063.11	\$ 89,238.23	\$ 4,249.44
X											\$ 91,915.17	\$ 4,376.91
Y												
Z												

Step Placement *

- 0-3 Years of Service = A
- 4-6 Years of Service = B
- 7+ Years of Service = C

*Exceptions may include CTE and teaching positions that are hard to fill.

Source: http://www.nctq.org/docs/St._Louis_16-17_Teacher_Salary_Schedule.pdf

These salary schedules for teachers contrast with how pay is determined in most other professions. In medicine, what doctors and nurses earn varies by specialty, such as surgeons relative to general practitioners. Even within the same hospital or HMO, pay will differ by specialty field. In universities there are large differences in pay between faculty by teaching fields, i.e., business compared to the liberal arts. And faculty pay structures in most higher education institutions are flexible, adjusting much more rapidly to changes in the market. It is not uncommon for institutions to match counter-offers for more successful faculty whom they wish to retain. Merit or performance-based pay is commonplace. Ballou and Podgursky (1997) and Ballou (2001) report generally similar findings for private K-12 education. Even when private schools report that they use a salary schedule for teacher pay, payments "off schedule" are commonplace.

Rigid salary schedules might have some efficiency rationale if the factors rewarded—teacher experience and graduate education—were strong predictors of teacher productivity. However, surveys of the education production literature find no support for a positive effect of teacher graduate degrees. Of 41 studies investigating the “value-added” of the effect of education levels on teacher effectiveness (primarily Master’s degrees), Hanushek (2003) reports that not a single study found a statistically significant positive effect: greater education levels do not improve teacher productivity. In fact, 10 of the studies actually found negative effects. Furthermore, teacher experience has little effect of productivity beyond the first few years (Hanushek and Rivkin, 2004). But while this

increase in education does not seem to improve teacher productivity in the classroom, salary steps and advanced-education bonuses add substantially to instructional costs. Roza (2007) estimates that 12 percent of per pupil spending is absorbed by salary schedule payments for experience and MA degrees alone.

3.1 What Clears The Market For Teachers

There is a popular aphorism in economics: “You can’t repeal the law of supply and demand.” By this economists mean that if price is not allowed to clear a market something else will. In our context, if salaries are not allowed to clear the market for teachers, then the market will clear in other ways. We now consider several of the consequences of rigid salary schedules for school staffing.

3.1.A Single salary schedule suppresses pay differentials by teaching field.

All teachers in a district with the same experience or education level earn the same base pay. A second grade teacher will earn the same base pay as a high school chemistry teacher. Given the major differences in human capital investments by teaching field (e.g., elementary education versus secondary physical science) it is almost certainly the case that non-teaching opportunity earnings differ greatly as well.

National data on teacher recruiting bear this out. The data, reported in Table 3, are from the 1999-00 and 2007-08 Schools and Staffing Surveys (SASS). These are assessments of market conditions by administrators who have recently

Table 3
Recruitment Difficulties by Teaching Field

1999-00	How Easy was it to fill the vacancy?			
	Easy	Somewhat Difficult	Very Difficult	Could Not Fill
Elementary	67.6 %	26.2 %	5.5 %	.7 %
Social Studies	70.0	24.7	4.7	.6
ELA	56.5	33.2	9.5	.8
Math	29.0	34.8	33.3	2.8
Biological Sci.	34.0	38.5	26.2	1.3
Phys. Sci	31.7	35.7	30.2	2.4
Spec. Ed.	25.5	35.8	32.8	5.8
2007-08	Easy	Somewhat Difficult	Very Difficult	Could Not Fill
Elementary	74.3	21.7	3.7	0.3
Social Studies	68.2	26.3	5.1	0.5
ELA	58.7	31.7	8.1	1.6
Math	35.0	34.1	28.5	2.4
Biological Sci.	30.1	39.0	28.6	2.4
Phys. Sci	28.8	40.0	28.9	2.3
Spec. Ed.	32.6	38.2	25.9	3.3

Source: Schools and Staffing Surveys, various years.

recruited teachers in these fields. Respondents were asked to rate how difficult or easy it was to fill a vacancy in the field. In 2007-08, 74 percent of school administrators reported that it was “easy” to fill vacancies in elementary education, with just four percent reporting it “very difficult” or that they could not fill the position. The situation changes dramatically when we turn to math, science, and special education, where a large share of districts reported it was “very difficult” or they were unable to fill a vacancy. These patterns also prevailed in high poverty schools. While low poverty schools reported greater ease in recruiting, nonetheless 63 percent of high poverty schools reported it easy to fill vacancies in elementary education.⁵

Further evidence on this point may be found by examining the non-teaching earnings of former teachers after they have left the profession. Former elementary school teachers (on average) earned less than secondary school teachers in their non-teaching pursuits. Among former secondary teachers, those who taught in technical fields earned more than those in non-technical fields (Goldhaber and Player, 2005). In a market with flexible wages, earnings of elementary teachers would fall relative to science, math, and special education teachers. However, district salary schedules do not permit this relative wage adjustment to occur. Thus, the market “clears” in terms of quality rather than price. Numerous reports have documented the extent of “teaching out of field,” or teachers practicing with substandard licenses in the fields of science, math, and special education, while over 95 percent of elementary school teachers are fully licensed in

elementary education (U.S. Department of Education, 2004b).

The ubiquitous salary schedule reflects a deeper problem of personnel policy in public schools. Policy makers, as well as many researchers, tend to treat K-12 teachers as a single occupation. From a labor market or human resources perspective, this is not a useful aggregation. The training, working conditions, and non-teaching opportunities of a second grade teacher are very different from those of a high school chemistry teacher. Yet, for purposes of policy and in many research studies they are grouped into a single occupation: teachers.

This is in stark contrast to the market for college professors. In most policy contexts it would make little sense to talk about the labor market for “professors.” This market varies dramatically by field (as reflected in starting pay, for example). The “market” for finance professors is very different than for English professors. But the homogenization of public school teachers is encouraged in part by the collective bargaining process, which puts all teachers in a school district, regardless of the level of school or their teaching field, into a single “bargaining unit” with uniform pay schedules and other personnel rules. However, we do not want to overstate the collective bargaining effect. It is still true that single salary schedules are the norm even in states like Missouri where some districts that do not engage in collective bargaining.

3.1.B The single salary schedule suppresses differentials by schools within districts.

In larger urban districts dozens or even hundreds of schools are

covered by the same salary schedule. The working environments for teachers often vary greatly between schools in the same district. Some may be dangerous places to work, whereas other schools offer more pleasant and attractive worksites. Teachers in the less desirable schools often are able to use their seniority to transfer to a more pleasant school. Or, they may simply resign at a higher rate. In either case, the result is that students in high poverty schools will on average have less experienced (and less educated) teachers. Because the salary schedule assigns lower pay to teachers with less experience within a school district, an unintended consequence of a district-wide salary schedule is lower spending per student in high-poverty schools (Roza, et.al, 2007; Iatarola and Stiefel, 2003).

High poverty schools also will have relatively more novice or inexperienced teachers. One fairly consistent finding in the “teacher effects” literature is that students taught by novice or inexperienced teachers record lower achievement gains than students with more experienced teachers (e.g., Hanushek, Kain, O’Brien, and Rivkin, 2005; Aaronson, Barrow, and Sander, 2007; Boyd, et.al., 2006). Lankford, Loeb, and Wyckoff (2002) examine the allocation of teachers in New York City and find that children in high poverty schools are more likely to be exposed to novice teachers. Again, this is an intra-NYC allocation problem, one that is clearly exacerbated by a uniform salary schedule across all schools.

Closer to home, Podgursky (2008) examines an administrative data set with the universe of public elementary schools in Missouri. He finds that children in high poverty

schools are more likely to be exposed to novice teachers, but this is entirely due to the intra-district allocation of teachers. To return to our market-clearing thesis, if the attractiveness of working conditions varies among schools within a district, then equalizing teacher pay disqualifies teacher quality. In order to equalize teacher quality, one needs to disqualify teacher pay.

3.1.C Single Salary Schedules Lead to Equalization of Pay Regardless of Teacher Effectiveness.

A consistent finding in the literature is that there is a very large variation in teacher effectiveness (e.g., Rivkin, Hanushek, and Kain, 2005; Aaronson, Barnow, and Sander, 2007). Even within the same school building, some fourth grade teachers are much more effective at raising student achievement than other fourth grade teachers. Some teachers are harder working and elicit greater effort from students than others, while other teachers may be “burnt out” and simply putting in time until retirement (more on pension system incentives below). The single salary schedule suppresses differences between more effective and less effective teachers (however defined).

Rewarding more effective teachers on the basis of performance would have two important consequences. The first is a motivation effect. Incumbent teachers would have an incentive to work harder to raise whatever performance measure is rewarded. The second is a selection effect. Over the longer term, performance pay would draw teachers into the workforce who are relatively more effective at meeting the performance targets and would also help retain such

teachers (Podgursky and Springer, 2007). Economic theory predicts (correctly) that over time, equalizing teacher pay among teachers of different effectiveness will tend to lower the overall quality and performance of the teaching workforce.

4. CONFOUNDING FACTORS: TENURE AND THE SIZE OF WAGE-SETTING UNITS

The costs associated with rigid teacher salary schedules are amplified by two other features of K-12 human resource policy: tenure and the size of wage-setting units (i.e., districts).

Consider first the effect of teacher tenure. Even if experience per se does not raise a teacher’s effectiveness, in principle a seniority-based wage structure might be efficient if less effective teachers are weeded out over time through contract non-renewal.

Unfortunately, personnel policies in traditional public schools preclude such an effect. Teachers in traditional public school districts receive automatic contract renewal (tenure) after two to five years on the job (five years in Missouri). After receiving tenure, it is very difficult to dismiss a teacher for poor job performance, a finding which has been widely documented (Bridges, 1992; Hess and West, 2006). The presence of teacher tenure laws and collective bargaining language, which further hampers dismissal of low-performing teachers, thus makes the economic costs associated with single salary schedules even greater.

The other factor that increases the cost of rigid district salary schedules is the size of wage-setting units. Other things equal, the larger the

size of the unit the greater the economic cost of rigid salary schedules. The wage-setting unit in private and charter schools is typically the school. In traditional public schools, wage-setting is done at the district level. In fact, most personnel policy concerning teachers—the level and structure of teacher pay, benefits, and recruiting—is centralized at the district level in traditional public schools.

This policy of centralizing policymaking has two effects. First, it makes the market for teachers less flexible and less competitive. Consider a district with 50 schools. Rather than let 10 “sub-districts” set pay for five schools and compete with one another for talent, a single employer sets pay for all 50 schools. At least the 10 smaller districts could compete with one another and adjust their schedules to best meet their own internal circumstances.

A second consequence of large wage setting-units is that the wage-setting process becomes more bureaucratic and less amenable to merit or market adjustments at the individual level (Podgursky, 2010). The size distribution of these districts in terms of teacher employment is very highly skewed, with the consequence that most teachers are employed in large school districts. Nationally, one quarter of teachers in traditional public schools are employed in districts with at least 2,100 full-time equivalent (FTE) teachers, and half of traditional public school teachers are in districts with at least 561 FTE teachers. Thus, the typical teacher finds herself in a large organization with standardized, bureaucratic wage-setting. By contrast, the average charter school—an independent employer—employs

just 16 FTE teachers, barely larger than the average private school (15 FTE teachers).

In principle, public school districts need not be so bureaucratic. They could (should) adopt more decentralized systems of personnel policy, give school principals more control over teacher recruitment and pay, and adopt more of a team model. The fact that one observes wage-setting in private schools, including Catholic dioceses, following a more decentralized model suggests that there are few efficiency gains to be had from centralization of compensation.

This highlights an important difference between traditional public and charter or private schools. The percent of teachers covered by collective bargaining agreements in charter schools is far lower than in traditional public schools. And for private schools, it is virtually nil (Podgursky, 2010). The absence of a binding collective bargaining agreement is an important source of personnel flexibility in private and charter schools. Teacher unions in general have been opposed to more flexible market- or performance-based pay systems. In addition, collective bargaining laws, by treating the district as the “appropriate bargaining unit,” have tended to push personnel policy and wage-setting to the larger district level and lock them there.

5. DEFERRED COMPENSATION: TEACHER PENSION INCENTIVES

Pensions have long been an important part of total compensation for teachers in public schools. Traditionally, it has been argued, salaries have been relatively low, while pension benefits have been relatively high for teachers and

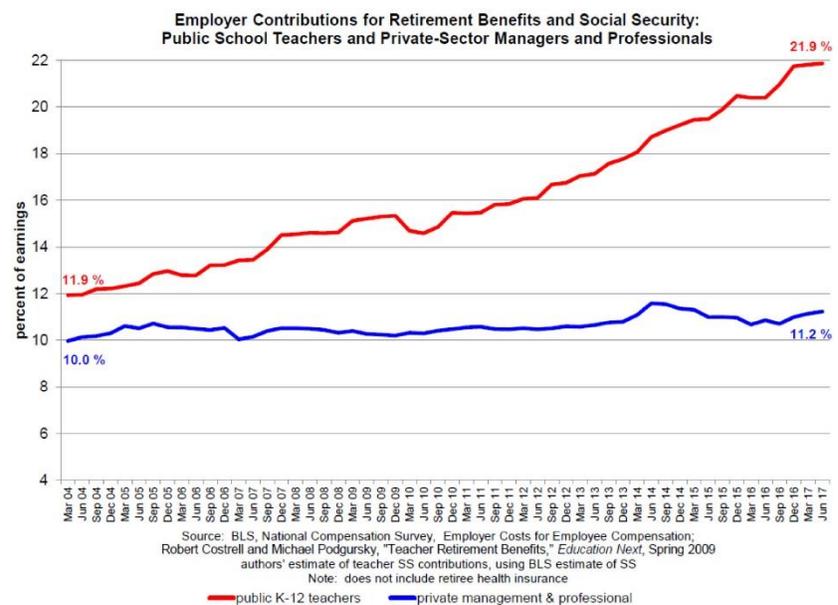
others who spend their career in public service. This mix of current versus deferred income was rationalized by the contention that the public good was best served by the longevity of service that would be induced by these pension plans.⁶ In recent decades, however, increasing amounts of evidence have shown that many of these plans, both in the private and public sector, may actually have shortened rather than lengthened professional careers by encouraging early retirements.⁷

The cost side of teacher retirement benefits affects the market for teachers by driving a wedge between the amount paid by employers and the take-home pay received by teachers. In Missouri, the combined contributions of teachers and school districts for retirement benefits in the state teacher retirement plan have risen steadily from 20 percent

of salary in 2004 to 29 percent today. The costs of school retiree benefits, including “legacy” costs from unfunded benefits for previous retirees, consume a growing share of K-12 budgets.

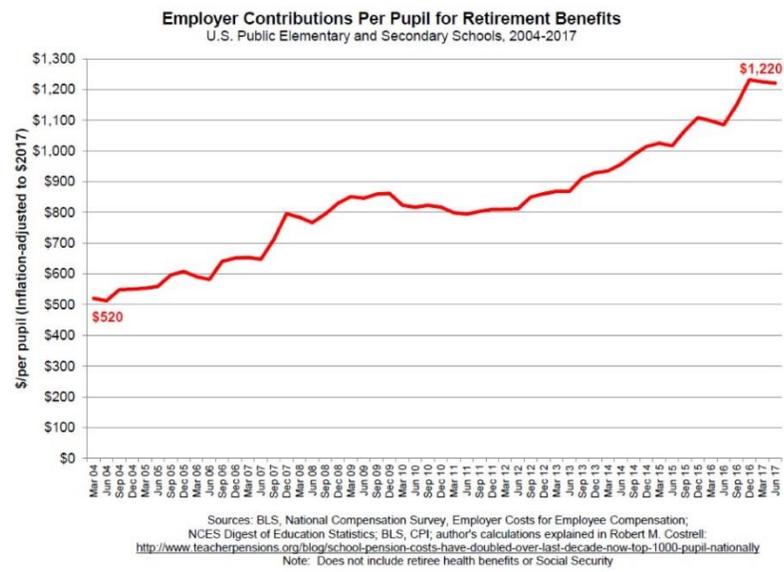
Figure 3 shows employer costs for retirement and Social Security for teachers and private sector managers and professionals based on data collected by the U.S. Department of Labor. Benefit rates for professionals in private firms have been relatively flat at about 10 percent of salaries since 2004. By contrast, teachers’ costs have risen from about 12 to 15 percent of payroll over the same period. As a result, the gap in retirement benefit costs as a percent of salaries widened from 1.9 to 10.7 percent of earnings or \$1220 per student, which is roughly 10.5 percent of per pupil operating expenditures (Figure 4)

Figure 3
Employer contribution to public teacher and private professional retirement and Social Security as a percent of salary



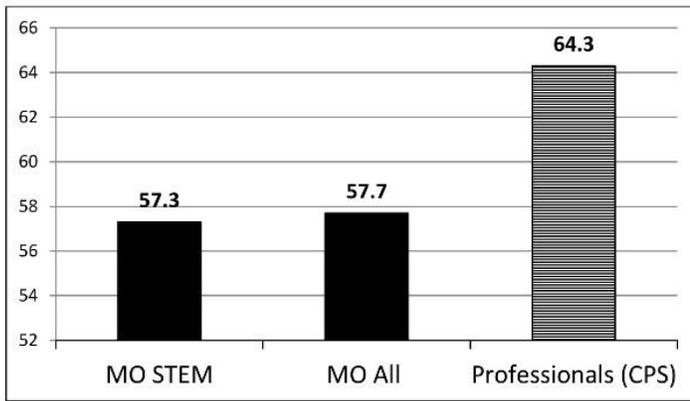
Source: <http://www.uaedreform.org/downloads/2017/09/employer-contribution-rates-update-9-8-17.pdf>

Figure 4
Real Spending Per Student on Teacher Pensions



Source: <http://www.uaedreform.org/downloads/2017/12/employer-contributions-per-pupil-12-20-17.pdf>

Figure 5
Mean Retirement Ages: Missouri Teachers and College-Educated Non-Teacher Professionals



Notes: These are the conditional mean ages for teachers and college-educated (non-teacher) professionals, aged 50-65 who were employed in year t and left the workforce in year t+1. For MO this is the average for teachers employed 2008-2013; for the professionals, years 2008-2014.

Source: Kim, et. al. (2017b)

Figure 3 understates the actual gap in retirement benefits for two reasons. First, the BLS data do not include employer contributions for retiree health insurance, which are substantial in some states and

districts, but have all but disappeared in the private sector. While these vary by state and district, Richwine and Biggs (2011) estimate them to be roughly eight percent of earnings.

Second, a comparison of employer contributions significantly understates the value of pension benefits accrued by teachers as compared to private sector professionals. Richwine and Biggs (2011) point out that the teacher contributions are implicitly guaranteed a much higher return (about eight percent) than the risk free rate available to private sector professionals investing in individual retirement accounts (roughly four percent). When this differential is applied to contributions and compounded over a work life, it produces a huge differential in pension wealth at retirement. Taking this differential return into account, Biggs and Richwine estimate that the pension wealth generated by one percent of salary for public school teachers would require nearly three percent of salary for private sector professionals. This implicit guarantee of a high yield to employer and employee contributions plays an important role in Richwine and Biggs's finding that, on average, the total compensation of public school teachers exceeds that of private sector professionals.

An important research question is the effect of these retirement benefits systems on the teaching workforce. Costrell and Podgursky (2009,2010) find that the pattern of pension wealth accrual in teacher defined benefit systems creates strong incentives to pull teachers to a given age and then push them out of the workforce afterward, with the push encouraging teachers to retire at relatively early ages by economy wide standards. This is illustrated by the data in Figure 5. These pension systems also impose very large costs on mobile teachers. Several studies find that pension rules strongly affect the timing of

teacher retirement behavior (among others, Ferguson, et. al. (2006), Brown, 2009; Costrell and McGee, 2009; Ni and Podgursky, 2016). A recent paper examining Missouri teacher salary schedules by districts finds a substantial disequalizing effects from the pension annuity formula favoring wealthier districts with steeper salary schedules (Shuls, 2017).

It is difficult to discern an efficiency rationale for heavily back-loaded pension wealth accrual and mobility penalties. The fairly massive back loading of benefits might be justified if there were (was?) evidence of large returns to experience and important job specific human capital investments. However, the majority of empirical studies of teacher effectiveness find that novice teachers (e.g., teachers with less than three years of experience) on average are less effective than more senior teachers, but thereafter the returns to experience level off quickly. There is little evidence that a teacher with 20 years' experience is any more effective in the classroom than a teacher with 10 years' experience. Ironically, the current pension system, by pushing many teachers into early retirement, actually raises the steady-state share of novice teachers in the workforce and in turn lowers overall teacher effectiveness.

Turning from the timing of teacher retirement to workforce quality and teacher staffing, the literature on teachers is slimmer still, but growing. Koedel and Podgursky (2012) find no evidence that the “pull” of the back-loaded pension benefits raises teacher quality, as measured by student achievement gains. They find that the “push” effect tends to induce more effective teachers to retire earlier

than they otherwise would. Fitzpatrick and Lovenheim (2014) analyze an early retirement bonus in Illinois and find that when early retirements by teachers near conventional retirement ages were incentivized, student achievement rose. This suggests that the “pull” incentives in these plans are holding in less effective teachers. Regarding mobility penalties, Kim, et. al. (2017a) find that schools that operate near state (and thus pension) borders have lower performance outcomes than similar schools operating “inland.” This finding suggests that frictions associated with state borders (licensing and pension mobility penalties) impede efficient operation of markets for teachers.

To summarize, the traditional teacher pension plans are increasingly costly, provide strong incentives for early retirement, and impose large penalties for teacher mobility. There is little evidence that these incentives improve workforce quality. Indeed, the virtual disappearance of these types of defined-benefit pension plans for private sector professionals, in favor of mobile 401k or 403b type plans, suggests that they are not effective tools for HR tools for educated, young professionals.

6. CONCLUSION: SOME PRINCIPLES FOR COMPENSATION REFORM

When it comes to reform, accountability pressures are starting to force school districts to address the inefficiencies in such a compensation system and rethink how they are spending roughly \$300 billion annually in compensation of instructional personnel. Federal programs in the United States, such as the Teacher Incentive Fund (TIF), are encouraging states to

experiment with performance and market-based pay. Minnesota, Florida, and Texas have developed programs to encourage their districts to develop such programs. A number of large urban districts, most notably Denver, also have taken important steps in this direction. Performance and market-based incentives are much more common in charter schools and are expanding with the charter school base. They are also more common in private schools and may expand as well if private school choice programs are expanded.

Rather than conclude this study with a laundry list of reforms, I focus instead on some general economic principles that should guide reform. In this regard, it is important to recognize that the information necessary to implement personnel policies in education is highly decentralized. In general, regulators in state education departments lack information on teacher quality or performance. They can monitor teacher credentials but not the localized and often classroom-specific information that adds up to effective individual teaching and exemplary contribution to team activities in the school.⁸ This suggests several general principles.

1. Focus accountability on student learning. The focus of regulation should be on what state regulators can measure—student learning—and not on what they can't—teacher quality. Teacher performance and effort are localized data. State regulators can monitor teacher credentials but they lack more detailed information on teacher quality or performance. Value-added measures at the teacher or school level can be provided to school administrators, but

decisions about how to use the data should be left to local decision makers. It is important that school districts face the right incentives to make the best use of these data. This can take the form of top-down state accountability systems or bottom-up school choice programs, or some combination of the two. Whatever the mix, all stakeholders—parents, taxpayers, educators—should be provided with extensive data on school and district performance outcomes in order to increase visibility in the market.

2. Provide “regulatory space” for experimentation. To the extent possible, school district administrators (and charter school leaders) should be provided with the opportunity to experiment with alternative compensation policies. Instead of a single-minded application of single salary schedules as is common today, this “space” must include the capacity for local administrators to renegotiate collective bargaining agreements, deviate from state-wide teacher salary schedules where they exist, and implement alternative benefit packages. Governor Walker’s restriction of the latitude of bargaining in Wisconsin provides an example of how changes in the scope of bargaining in collective bargaining law, and thus an expansion of management prerogatives can help bring down fringe benefit costs (Costrell, 2012).

One of the most rigid and immobile components of educator compensation systems are statewide teacher pension

systems. Some states have allowed charter schools to opt out of state teacher pension plans (Olberg and Podgursky, 2011). Unfortunately, Missouri is not one of those states. This flexibility should be extended to charters in all states. In addition, individual school districts should be allowed to experiment with employment tracks that avoid the statewide plans entirely. In that way, new teacher recruits should be able to choose between traditional defined benefit retirement plans and portable defined contribution plans as they can in Florida, Ohio, and Utah.

Provide incentives for districts to experiment. As noted above, the federal TIF program provides competitive grants for districts to experiment with educator incentive plans. A few states have set up similar competitive grant programs: Examples include Procomp in Minnesota and DATE in Texas. Given the particular circumstances of school districts, regulators should avoid the temptation to micromanage. Efficient market-based compensation reforms for a rural Texas school district may be very different from the those for Dallas or Houston.

3. Reform the training of school administrators. It is commonplace, and more than a little self-serving, for those of us in the education industry to identify “more education” as the solution to any problem. That said, economists who work with school administrators are likely to encounter a disconcerting absence of, and aversion to, economic reasoning regarding

resource allocation and personnel economics. If states required an MBA rather than graduate training in education administration from schools of education for certifying school leaders, the single salary schedule would likely have been discarded long ago.

A fundamental long-term reform is to improve the training and selection of school administrators. In particular, it would be useful to have school administrators who have learned the basics of compensation design and personnel economics and are willing to put these ideas into practice. If not requiring an MBA, at a minimum textbooks on personnel economics, such as Lazear and Gibbs (2008)—widely used in top MBA programs—should be part of the curriculum in educator administration programs as well.

Unfortunately, the standards of the professional community in this regard (National Policy Board for Education Administration, 2002) make no explicit mention of training in these areas, but form the basis for accreditation of school administrator training programs. If existing programs are unwilling to incorporate such additional training into their curriculum, provision should be made for “alternative route” education administrator programs that permit entry of more entrepreneurial school leaders and equip their students with modern management tools.

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NOTES

¹ Unless otherwise indicated, throughout this paper the term “teacher” is assumed to mean a public K-12 teacher.

² The research on class size has largely focused on the lower elementary grades (e.g., K-3). Low student teacher ratios does not necessarily mean low elementary class sizes. For example, during the 2011-12 school year the average class size in elementary schools was 21.6 students, while the student teacher ratio was roughly 16 (https://nces.ed.gov/surveys/sass/tables/sass1112_2013314_t1s_007.asp). School administrators may use favorable staffing ratios to provide teachers with more time out during the day. Schools may use the additional teaching staff for other types of classes with small enrollments, special education, or tutoring assignments, pull-out classes, to take but a few examples.

³ Some states that have statewide schedules for teachers also have schedules for principals. The statewide (minimum) salary schedule for principals in North Carolina may be found [here](#).

⁴ Other Missouri schedules are available at the [Missouri State Teachers Association website](#). A [database of salary schedules](#) for large US school districts are maintained by the National Council on Teacher Quality.

⁵ Podgursky (2010). For updated data from these surveys see Cowen, et.al. (2016).

⁶ NEA, 1995, p. 3. As the NEA report points out, however, this purpose has “been lost for many in the mists of time,” and “many pension administrators would be hard-pressed to give an account of why their systems are structured as is except to say that ‘the Legislature did it’ or ‘It is a result of bargaining.’”

⁷ Friedberg and Webb (2005) showed that the private sector shift toward defined contribution plans contributed to the rise of retirement ages since the 1980s. With regard to teachers, Harris and Adams (2007) find considerably higher rates of labor force exit at ages 56-64 than in comparable professions, as well as evidence that this is due to their pension coverage.

⁸ A useful reference in this regard is Hayek (1945).

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