Funding Disparities and the Inequitable Distribution of Teachers: Evaluating Sources and Solutions

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Abstract: The inequitable distribution of well-qualified teachers to students in the United States is a longstanding issue. Despite federal mandates under the No Child Left Behind Act and the use of a range of incentives to attract teachers to high-need schools, the problem remains acute in many states. This study examines how and why teacher quality is inequitably distributed, by reviewing research and examining data on school funding, salaries, and teacher qualifications from California and New York—two large states that face similar demographic diversity and educational challenges. Using wage adjustments to control for cost of living differentials, we find that both overall school funding and teacher salary levels are highly inequitable both across and within states – generally exhibiting a ratio of 3 to 1 between high- and low-spending jurisdictions. Furthermore, low-salary districts serve students with higher needs, offer poorer working conditions, and hire teachers with significantly lower qualifications, who typically exhibit higher turnover. We find that districts serving the highest proportions of minority and low-income students have about twice as many uncredentialed and inexperienced teachers as do those serving the fewest. In an elasticity analysis, we find that increases in teacher salaries are associated with noticeable decreases in the proportions of teachers who are newly hired, uncredentialed, or less well educated. These teacher qualifications, in turn, are associated with student achievement, holding student characteristics constant. We review research on strategies that have been largely unsuccessful at addressing this problem, such as

"combat pay" intended to recruit teachers to high need schools, suggesting that small bonuses might be productive if added to an equitable salary structure where working conditions are comparable, but may be inadequate to compensate for large differentials in salaries and working conditions. We review studies illustrating successful policy strategies in states that have taken a more systemic approach to equalizing salaries, raising teaching standards, and providing supports for teacher learning and school development. We recommend federal initiatives that could provide stronger supports and incentives for equalizing students' access to well-qualified and effective teachers, including equalizing allocations of ESEA resources across states, enforcing existing ESEA comparability provisions for ensuring equitable funding and equally qualified teachers to schools serving different populations of students, evaluating progress on resource equity in state plans and evaluations under the law, and requiring states to meet standards of resource equity – including the availability of well-qualified teachers – for schools identified as in need of improvement.
Keywords: teacher salaries, school funding, teacher qualifications, inequality, teacher distribution

Disparidades de financiamiento y la distribución desigual del personal docente: Evaluando fuentes y soluciones

Resumen: La distribución desigual de docentes con buenas calificaciones para estudiantes en los Estados Unidos es un problema de larga data. A pesar de los mandatos federales de la ley *No Child Left Behind* (Que Ningún Niño se Quede Atrás) y el uso de una serie de incentivos para atraer a docentes a las escuelas con mayores necesidades, el tema sigue siendo preocupante en varios estados. Este estudio examina cómo y por qué la calidad docente se distribuye desigualmente a través de una revisión de la literatura y el análisis de datos sobre financiamiento escolar, salarios, calificaciones de los maestros en California y Nueva York - dos grandes estados de gran diversidad demográfica y que enfrentan similares desafíos educativos. Utilizando ajustes salariales para controlar las diferencias por costo de vida, encontramos que tanto la financiación global de la escuela como los niveles salariales de los docentes son altamente desiguales, tanto entre estados como dentro del mismo estado - generalmente con una proporción de 3 a 1 entre las jurisdicciones con gastos altos y bajos. Además, los distritos escolares con bajos salarios sirven a los estudiantes con mayores necesidades, ofrecen condiciones más precarias de trabajo y contratan docentes con calificaciones significativamente más bajas, que por lo general tienen un mayor volumen de rotación. Se encontró que los distritos que sirven estudiantes de minorías y de bajos ingresos en mayor proporción tienen el doble de docentes no certificados y con menos experiencia que aquellos que sirven en menor proporción a estudiantes de esos grupos. En un análisis flexible, encontramos con que los aumentos de salarios de los docentes se asocian con descensos notables en las proporciones de los docentes recién contratados, sin acreditación, o con cualificaciones menores. Las cualificaciones de los docentes, a su vez, están asociadas con logros académicos de los estudiantes, manteniendo constantes las características de los alumnos. Hemos revisado las investigaciones sobre las estrategias que han fracasado en el tratamiento de estos problemas, como la *"paga de combate"* que contrata profesores para escuelas con mayores necesidades, lo que sugiere que pequeñas bonificaciones pueden ser productivas si se añaden a una estructura salarial equitativas donde las condiciones de trabajo son comparables, pero puede ser insuficiente para compensar diferencias mayores en salarios y condiciones de trabajo. Hicimos una revisión de estudios que discuten estrategias exitosas de políticas en estados que usaron enfoques más sistémicos para igualar los salarios, aumentar el nivel educativo y los niveles de apoyo para el aprendizaje y capacitación del profesorado. Recomendar iniciativas federales que pueden proporcionar incentivos de apoyo y más fuerte para igualar el acceso de estudiantes a profesores bien cualificados y eficaces, incluida la igualdad de recursos de distribución de *ESEA* (Ley para la Educación Básica y Secundaria) en todos los estados, utilizar disposiciones de comparabilidad existentes en la *ESEA* para garantizar un financiamiento equitativo y docentes con las mismas

calificaciones para las escuelas que atienden a poblaciones de estudiantes de gran diversidad, evaluar el progreso en la equidad en los planes de recursos y revisiones de las leyes estaduales y obligar a los estados a que cumplan con las normas para la distribución equitativa de recursos - incluyendo la disponibilidad de docentes bien cualificados - para las escuelas identificadas con necesidades de mejora.

Palabras clave: salarios docentes; financiamiento escolar; calificaciones docentes; desigualdades; distribución de docentes

Disparidades de Financiamento e a Desigual Distribuição de Professores: Avaliando fontes e soluções

Resumo: A desigual distribuição de professores com boas qualificações por estudantes nos Estados Unidos é um problema de longa data. Apesar dos mandatos federais ao abrigo do *No Child Left Behind Act* (Ato Nenhuma Criança Deixada para Trás) e o uso de uma série de incentivos para atrair professores para escolas com maiores necessidades, o problema permanece sensível em vários estados. Este estudo analisa como e por que a qualidade dos professores é desigualmente distribuída, através da revisão de pesquisa e análise de dados sobre o financiamento de escolas, salários, e qualificações dos professores da Califórnia e Nova Iorque – dois grandes estados que enfrentam uma diversidade demográfica e desafios educacionais semelhantes. Utilizando reajustes salariais para controlar custos diferenciais de vida, descobrimos que tanto o financiamento global da escola como os níveis salariais dos professores são altamente desiguais tanto entre estados como dentro do mesmo estado – apresentando geralmente um rácio de 3 para 1 entre jurisdições de alto e baixo gastos. Para além disso, distritos escolares com salários baixos atendem estudantes com maiores necessidades, oferecem condições mais precárias de trabalho, e contratam professores com qualificações significativamente baixas, que apresentam normalmente maior rotatividade. Descobrimos que os distritos que servem as maiores proporções de minorias e de estudantes com baixos rendimentos têm cerca de duas vezes mais professores não credenciados e inexperientes do que aqueles que servem o menor número desses grupos de estudantes. Numa análise flexível, descobrimos que os aumentos nos salários dos professores estão associados a notáveis diminuições nas proporções de professores recém-contratados, não credenciados, ou com qualificações mais baixas. Essas qualificações dos professores, por sua vez, estão associadas ao desempenho do aluno, mantendo constante as características dos alunos. Fizemos uma revisão da pesquisa sobre as estratégias que têm fracassado na abordagem a este problema, como por exemplo "*combat pay*" destinado a recrutar professores para escolas com maiores necessidades, sugerindo que pequenos bônus podem ser produtivos se adicionados a uma estrutura salarial equitativa onde as condições de trabalho são comparáveis, mas podem ser insuficientes para compensar grandes diferenciais de salários e de condições de trabalho. Fizemos uma revisão dos estudos que ilustram estratégias políticas bem-sucedidas em estados que tiveram uma abordagem mais sistémica para equalizar salários, elevando os padrões de ensino, e a prestação de apoios para a aprendizagem dos professores e para o desenvolvimento da escola. Recomendamos iniciativas federais que possam fornecer apoios e incentivos mais fortes para equalizar o acesso dos estudantes a professores com boas qualificações e eficazes, incluindo a equalização da afetação dos recursos do ESEA (Ato para a Educação Básica e Secundária) entre estados, fazendo cumprir as disposições existentes de comparabilidade do ESEA no sentido de garantir um financiamento equitativo e professores com as mesmas qualificações para escolas que atendem diferentes populações de estudantes, avaliando o progresso na equidade dos recursos nos planos do estado e avaliações ao abrigo da lei, e que obriguem os estados a cumprir as normas para a equidade dos recursos – incluindo a disponibilidade de professores com boas qualificações – para escolas identificadas como necessitando de melhorias.

Palavras chave: salários docentes; financiamento escolar; qualificações docentes; desigualdades; distribuição dos docentes.

Introduction

For many decades, well-qualified teachers have been inequitably distributed to students in the United States. By every measure of qualifications—certification, subject matter background, pedagogical training, selectivity of college attended, test scores, or experience—less qualified teachers often teach in schools serving greater numbers of low-income and minority students (Lankford, Loeb, & Wyckoff, 2002; Socias, Chambers, Esra, & Shambaugh, 2007). Studies in state after state have found that students of color in low-income schools are 3 to 10 times more likely to have teachers who are uncertified, not fully prepared, or teaching outside their field of preparation than students in predominantly white and more affluent schools (Darling-Hammond, 2010).

Because of public attention to these disparities, Congress included a provision in the No Child Left Behind Act of 2002 that states should ensure that all students have access to "highly qualified teachers," defined as teachers with full certification and demonstrated competence in the subject matter field(s) they teach. This provision was historic, especially since the students targeted by this federal legislation—those who are low-income, low-achieving, new English language learners (ELLs), or identified with special education needs—are least likely to have experienced, certified, and fully-prepared teachers who are teaching within their field of preparation. As Kati Haycock (2000, p. 4) has noted, the usual statistics about teacher credentials, as shocking as they are, actually *understate* the degree of the problem in the most impacted schools:

> The fact that only 25% of the teachers in a school are uncertified doesn't mean that the other 75% are fine. More often, they are either brand new, assigned to teach out of field, or low-performers on the licensure exam…There are, in other words, significant numbers of schools that are essentially dumping grounds for unqualified teachers – just as they are dumping grounds for the children they serve.

The problem of inequitably distributed teachers has remained a widespread major concern despite the intentions expressed in NCLB, as well as noteworthy progress in some states (Darling-Hammond & Sykes, 2003). Disparity in the access of rich and poor children to well-qualified teachers appears consistently in the more than 40 state school finance suits currently active across the country (Darling-Hammond, 2010).

Efforts to address the issue—ranging from training subsidies and bonus pay to alternative pathways into teaching—have helped only erratically. In January of 2011, a coalition of more than 70 civil rights, disability, parent, community and education groups, concerned by Congressional efforts to lower the standards for highly qualified teachers so that not-yet-prepared recruits would be deemed qualified, called on the president and the Congress to develop a more effective set of national policies "that will allow the nation to put a well-prepared and effective teacher in every classroom" (Public Advocates, 2011, p.2). Realizing such goals will require research that enables policymakers to understand both the current situation and potentially effective solutions that address the problem at its source. This study intends to contribute to this knowledge base.

This article reports the results of a study examining how and why teacher quality is so inequitably distributed. In this study, we define teacher quality in terms of qualifications indicators that are collected in large-scale state data bases: teachers' certification in the field they teach, their years of experience in teaching, and their level of education (bachelor's and master's degrees). The first two of these criteria are also used in the Elementary and Secondary Education Act's definition of teacher qualifications for purposes of comparability reporting.

We define the degree of inequitable distribution in terms of differences in the proportions of teachers who meet these qualifications standards in schools serving more and fewer low-income and minority students. We review previous research on these questions and examine data from California and New York—two large states that both face demographic diversity and educational equity challenges. In 2008-09, California's student population was almost half Hispanic or Latino students and 7 percent African American students. In the same year, New York's public schools served 38 percent Hispanic or Latino students and about one-third African American students. Both states register large achievement gaps between affluent and poor students and between white, African American, and Latino students, along with substantial resource gaps. Although New York's schools are, on average, much better funded—at more than $17,000 per pupil in state and local funding in 2007, compared to California's $9,700—both display a wide range of funding across districts, as is true in most states in the country (Baker, Sciarra, & Farrie, 2010).

We explore whether and to what extent unequal salaries and the district revenues that underlie pay and working conditions may be at the root of the teacher distribution problem. We examine how funding, salaries, and working conditions vary across districts and how these variations correlate with teacher qualifications. We also examine the relationship between these differences in teacher quality indicators and student achievement, controlling for student demographics known to influence achievement.

In what follows, we briefly review the literature on these questions and present analyses from California and New York State. Finally, we discuss strategies that states have found successful in recruiting well-qualified teachers to high-need schools, and we draw implications for federal policy that may help resolve this dilemma that has, for so long, reinforced the achievement gap.

Why Worry about Teacher Qualifications?

A growing body of research has shown that teacher qualifications matter for student achievement. Studies at the state, district, school, and individual student level have found that teachers' academic background, preparation for teaching, certification status, and experience significantly affect their students' learning gains (Betts, Rueben, & Danenberg, 2000; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006; Clotfelter, Ladd, & Vigdor, 2007; Darling-Hammond, 2000; Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Ferguson, 1991; Fetler, 1999; Goe, 2002; Goldhaber & Brewer, 2000; Hawk, Coble, & Swanson, 1985; Monk, 1994; Strauss & Sawyer, 1986).

These findings appear to extend around the world. Akiba, LeTendre, and Scribner (2007), for example, found that the most significant predictors of mathematics achievement across 46 nations included teacher's certification, a college major in mathematics or mathematics education, and at least three years of teaching experience. These same variables—reflecting what teachers have learned about content and how to teach it to a range of learners—show up in study after study as predictors of teachers' effectiveness. This study also found that, although the national level of teacher quality in the United States is similar to the international average, the opportunity gap in students' access to qualified teachers between students of high and low socioeconomic status (SES) is among the largest in the world.

In combination, teachers' qualifications can have substantial effects. For example, a carefully designed large-scale study of high school student achievement in North Carolina used a longitudinal statewide dataset offering rich information about both students and teachers to analyze individual-level student achievement gains by course and subject area. The study found that students' achievement growth was significantly higher if they were taught by a teacher who was certified in his or her teaching field, fully prepared upon entry (rather than entering through the state's alternative

"lateral entry" route), had higher scores on the teacher licensing test, graduated from a competitive college, had taught for more than two years, or was National Board Certified (Clotfelter et al., 2007). Each of these qualifications was associated with greater teacher effectiveness, a finding replicated in other studies cited earlier, and each was differentially allocated to more and less advantaged groups of students.

Moreover, the researchers found that the combined influence on achievement growth of having a teacher with most of these qualifications as compared to one with few of them was larger than the effects of race and parent education combined, or the average difference in achievement between a typical white student with college-educated parents and a typical black student with high-school educated parents. While achievement from one year to the next is still largely dependent on prior achievement, this finding suggests that the achievement gap might be reduced over time if minority students were more routinely assigned highly qualified teachers, rather than the poorly qualified teachers they most often encounter.

A similar large-scale study of teachers in New York City, also using rich data about teacher qualifications linked to longitudinal individual-level student data, found that students' achievement growth in elementary and middle school mathematics was most enhanced by having a fully certified teacher who had graduated from a university-based pre-service teacher education program, who had a strong academic background (as measured by math SAT scores), and who had more than two years of experience (Boyd et al., 2008). Students' achievement was hurt most by having an inexperienced teacher on a temporary license—again, a teaching profile most common in high-minority, low-income schools.

When New York City raised salaries significantly in response to a court order, greatly reduced emergency hiring, and took steps to improve teacher retention in high-need schools, the profile of teachers in high-poverty schools shifted substantially, with increases in the proportions of certified, experienced, and better prepared teachers. Analyses by a team of economists showed that, in combination, improvements in these qualifications reduced the gap in achievement between the schools serving the poorest and most affluent student bodies by 25 percent (Boyd et al., 2008). Their findings suggest that changing the mix of teachers available to students can influence achievement, and policies which tackle the twin problems of inadequate and unequally distributed teacher quality may help reduce the achievement gap.

Policy Efforts to Address Inequitable Teacher Quality

A plethora of potential solutions to shortages of well-qualified teachers in high-need districts has been proposed. The most commonly tried ideas have been bonuses or "combat" pay to fill vacancies in hard-to-staff schools and the creation of alternative routes into teaching that recruit candidates directly into the districts where they are needed, with varying degrees of selectivity and prior training before they start teaching.

Incentive Pay

There are a range of incentives that can be used for recruiting teachers to high-need schools. Among the most widely implemented are bonuses used to attract teachers to schools that are hard to staff, often called "combat pay." This strategy alone has proved largely unsuccessful in recruiting a steady supply of well-qualified teachers to schools that suffer from high vacancy rates. One recent summary of the literature notes:

> (S)chool districts have tried offering additional pay for high-needs schools without much positive result, even when substantial bonuses are awarded. In 2004, Palm Beach, Florida eliminated its $7,500 high-needs school stipend after few teachers took the offer. Dallas's

offer of $6,000 to accomplished teachers to move to challenging schools also failed to generate much interest. … A decade ago, South Carolina set out to recruit "teacher specialists" to work in the state's weakest schools. Despite the offer of an $18,000 bonus, the state attracted only 20 percent of the 500 teachers they needed in the first year of the program, and only 40 percent after three years. (Berry, 2009b, p. 5)

Often, the failure of these programs has been that "combat pay" approaches typically do not address the other dysfunctions of under-resourced, high-need schools. As one National Board Certified teacher noted in a discussion of what would attract him to a high-needs school, "I would move [to a low-performing school], but I would want to see social services for parents and children, accomplished leadership, adequate resources and facilities, and flexibility, freedom and time" (Berry, 2009a, p. 16).

In addition, the size of most bonuses is not enough to address the underlying salary disparities across districts. A recent discussion between two experienced teachers from the Accomplished California Teachers (ACT) network surfaced this issue as they discussed what might recruit one of them from his wealthy district to his colleague's poorer district just a few miles away. They learned that David—a 13-year veteran with a master's degree and National Board Certification—would earn $26,000 less if he moved from his well-resourced district to Liane's less well-heeled district where he would teach higher-need students in larger classes with fewer supports. Even if the state offered a bonus of $10,000 per year to attract very accomplished teachers to such schools (twice what it once offered for National Board certified teachers to teach in high-need schools), David would still take a 20 percent annual pay cut (Accomplished California Teachers, forthcoming).

In fact, the federal Schools and Staffing Survey has found that the best-paid teachers in low-poverty schools earn over 35 percent more than those in high-poverty schools. Teachers in more advantaged communities also experience much easier working conditions, including smaller class sizes and more control over decision making in their schools (National Center for Education Statistics, 1997; Loeb, Darling-Hammond, & Luczak, 2005). Higher attrition rates in high-poverty schools are more frequently linked to dissatisfaction with teaching.[1] Teachers in high-poverty schools are much less likely to be satisfied with their salaries or to feel they have the necessary materials available to them to do their job (Darling-Hammond, 1997). They are also much less likely to say they that they have influence over decisions concerning curriculum, texts, materials, or teaching policies. These large discrepancies in base salaries and working conditions for districts within the same labor market contribute to the maldistribution of teachers.

Alternative Pathways to Teaching

Federal policy has encouraged the creation and expansion of alternative certification programs to attract teachers, especially in shortage fields, for more than a decade. The expansion of such programs has helped to staff schools in a number of communities, and has sometimes created more reliable pipelines, especially for high-need fields like mathematics, science, and special education.

The development of high-quality training models that offer strong preparation and close supervision, coupled with other reforms to improve recruitment and stem turnover, has helped stabilize staffing and strengthen teaching in some districts (Darling-Hammond & Sykes, 2003). Lower-quality models have also proliferated, however, and these programs offer little preparation

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[1] Low-poverty schools are those with less than 5 percent of their students receiving free or reduce-price lunch. High-poverty schools are those with more than 50 percent of their students receiving free or reduced-price lunch. (National Center for Education Statistics, 1995).

and uneven supervision for candidates who often begin teaching before they have completed their training (Darling-Hammond & Sykes, 2003). These routes typically have higher attrition rates from teaching, thus exacerbating the problems of high turnover, depriving students of the benefits of teacher experience and creating churn in schools that hire large numbers of such teachers (Guha et al. 2006; Hegarty, 2001; Henke et al., 1997).

The outcomes of such programs have been mixed, with higher-quality routes producing teachers who are more effective than those that offer little student teaching or coursework. A recent quasi-experimental study found that alternative certification candidates still in training were less effective than teachers who had completed their training, and those in the routes with the least coursework were the least successful, actually causing a reduction in student learning between the fall and spring test dates (Darling-Hammond, 2009).

California parents of students taught by intern teachers-in-training in the high-minority, low-income schools where they are concentrated recently sued the U.S. Department of Education because of regulations developed by the Bush administration allowing candidates who have just begun, but not yet completed, such a program to be counted as "highly qualified." The parents claimed that the department's rule sanctioned inadequate teaching for their children and masked the fact that they were being underserved, thereby allowing such teachers to be concentrated in the highest need schools and reducing pressure on policymakers to create policies that could rectify the situation. Although the parents won the lawsuit, it is currently being appealed.

Creating Strategies that Work

What would make a difference in the allocation of well-qualified teachers to all students? Most federal and state efforts have focused on a variety of surface-level remedies that appear to assume that basic funding and salaries are essentially equal and small incentives can be added on top of a level playing field in order to induce better-qualified and more effective individuals to choose hard-to-staff schools. Largely unexplored in currently proposed solutions to these problems are the large differences in salaries and working conditions that characterize American schools. These trace back, in turn, to differentials in funding across states, school districts, and schools that are largely ignored in the policy debates.

Previous Research

The Role of Salaries in Teacher Recruitment, Retention, and Quality

Evidence suggests that teachers' salaries can affect the supply of teachers both in the short run—especially the distribution of teachers across districts—and in the long run, in terms of the proportion of individuals willing to teach. Starting salaries within districts can influence whether the district is an attractive employer for beginning teachers; salary structures can influence whether the district is an attractive employer for veteran teachers (Pogodzinski, 2000).

Studies show that teachers respond to wages in their decisions to enter and remain in teaching (Dolton & Makepeace, 1993; Hanushek & Pace, 1995; Manski, 1987; Stinebrickner, 2000), and that relative salary levels can influence the qualifications of teachers. For example, one national analysis found that a 1 percent increase in teacher salaries in a metropolitan area would increase the proportion of teachers who have graduated from a selective college by 1.5 percent (Figlio, 1997). Another found that states in which teachers' salaries increased the most during the 1980s witnessed the greatest increase in the quality of teachers relative to non-teachers as measured by quality of undergraduate education (DeAngelis, 2000).

Salaries also appear to influence teacher attrition: Teachers are more likely to quit when they work in districts with lower wages (Brewer, 1996; Gritz & Theobald, 1996; Hanushek, Kain, & Rivkin, 1999; Mont & Rees, 1996; Theobald & Gritz, 1996). Those most responsive to salary differences in their decisions to remain in teaching include beginning teachers (Theobald, 1990), those in high-demand fields such as mathematics and science (Murnane & Olsen, 1990; Beaudin, 1995), and those who have higher measured ability (Stinebrickner, 1999). Presumably, these candidates have fewer constraints when looking at labor market options available to them.

Another way to assess whether wages attract higher-quality teachers is to look at the effect of teacher wages on student outcomes. Based on a meta-analysis of about 60 production function studies, University of Chicago researchers Greenwald, Hedges, and Laine (1996) estimated larger influences on achievement for increases in teacher salaries (as well as for teacher experience and education, which are rewarded in teacher salary schedules) than for other resources such as reduced pupil-teacher ratios. Similarly, looking across several decades of data, Loeb and Page (2000) found that student educational attainment increased most in states and districts that increased their wages.

In the largest school resource study since the Coleman report, Ferguson (1991) demonstrated that school spending makes a difference in increasing student achievement to the extent that expenditures focus on factors that improve instruction. He found that when regional cost differentials are accounted for, district spending positively affects student achievement primarily through the influence of funding levels on salaries that attract and retain more qualified teachers.

Ferguson found that the single largest measurable cause of student learning gains was teacher expertise, measured by teachers' performance on a statewide certification exam assessing basic skills and teaching knowledge, along with teacher experience, and master's degrees. The effects were so strong, and the variations in teacher expertise so great, that after controlling for socioeconomic status, the large disparities in achievement between black and white students were almost entirely accounted for by differences in the qualifications of their teachers. He concluded that "Skilled teachers are the most critical of all schooling inputs" (Ferguson, 1991, p. 490).

The Role of Working Conditions in Teacher Recruitment and Retention

Working conditions—including professional teaching conditions, such as the availability of instructional materials, class sizes, the attractiveness and safety of facilities, high-quality leadership, and professional learning opportunities—also play a role in teachers' decisions to leave teaching in a particular school or, sometimes, to leave the profession altogether. Teachers who have options want to work in schools that pay them adequately and support their efforts well. In addition, teachers are most likely to stay in schools where they feel successful in their work (Berry, 2009b).

A few studies have modeled the effect of working conditions or school resource allocation on teacher quality or teacher retention, finding that such things as extremely large pupil-staff ratios and smaller levels of expenditures for teaching materials are associated with higher staff turnover (Theobald, 1990; Theobald & Gritz, 1996). Although many studies have found that teacher attrition is related to the demographic characteristics of schools' student populations, a closer look indicates that, after controlling for student characteristics, both poor working conditions and low salaries influence turnover problems (Carroll, Reichardt, & Guarino, 2000; Loeb, Darling-Hammond, & Luczak, 2005). While the socioeconomic composition of a school's student body appears to be a strong influence on teacher turnover, race and class are no longer significant predictors of turnover once district salary levels and teachers' ratings of working conditions are added into the equation. Along with beginning teacher salaries, working conditions—including large class sizes, facilities and space problems, multi-track schools, and lack of textbooks—prove to be stronger predictors of turnover than the characteristics of the students.

Evidence that working conditions drive the frequently observed flight of teachers from schools serving concentrations of low-income and minority students is, from a policy perspective, relatively good news, since it points to remediable factors—other than the characteristics of students—that can be altered by policy to shape the availability of teachers to all students. In the recent *Williams v. California* lawsuit, which challenged the unequal distribution of state resources to school districts in California, teachers and administrators described how teacher attrition was associated with school conditions tied to inadequate resources in low-income school districts (Darling-Hammond, 2003). As one teacher explained, reflecting the views of many others:

> (It was) overwhelming working condition-based things that would make [the teachers] leave…. [How teachers are paid] was a part of it, but overwhelmingly the things that would destroy the morale of teachers were the working conditions, …working in these facilities, having to pay for supplies, etcetera. (Darling-Hammond, 2003, p.59)

These resource-related concerns augment the recruitment and retention problems caused by non-competitive wage structures.

How Unequal are School Resources?

The world's highest-achieving nations, fund schools equally and offer comparable salaries to teachers across schools (sometimes with incentives for those who will go to more remote locations). Education resources in the United States, however, continue to be very uneven. As a function of disparities both across and within states, the highest-spending districts in the nation spend about 10 times more than the lowest spending ones. For example, in our data set alone, there were districts spending as much as $54,000 per pupil in 2008-09 in relatively high-spending New York State and districts spending as little as $6,000 per pupil in relatively low-spending California in the same year.

The disparities nationwide are larger still: the highest-spending state in the nation (Vermont) spends nearly three times more on average per pupil than the lowest spending state (Utah)—a range of $17,552 to $6,586 (Baker, Sciarra, & Farrie, 2010). Gaps are still large after adjusting for cost-of-living differentials, poverty rates, population density, and economies of scale. With these adjustments, for example, Wyoming, at the top of the distribution, spends 2.5 times more per pupil than Tennessee, at the bottom (Baker, Sciarra, & Farrie, 2010). Furthermore, the ratio of per pupil expenditures in high- to low-spending districts within most states is also close to 3 to 1, a ratio that typically remains almost as large when adjustments for costs of living are made.

Funding disparities might not undermine equal educational opportunity if the differences were largely a function of pupil needs or if they appropriately reflected cost-of-living differentials. As it turns out, however, differentials do not tend to favor the districts serving the highest need students, and they persist after cost-of-living differences and pupil needs are taken into account. For example, the Education Trust calculates a differential between high- and low-poverty districts and between high- and low-minority districts within each state. Adjusted for costs of living, the poverty differential in New York (that is, the amount that high-poverty districts spend per pupil relative to low-poverty districts) was -$2,927, and the race differential was -$2,636 in the Trust's most recent report. In California, a lower spending but somewhat more equalized state, the poverty differential was -$259 and the race differential was -$499 (Education Trust, 2006). In neither case did the differentials favor districts serving more high-need students.

This inequitable funding is a function of the highly decentralized system of governance that began when local communities created public schools more than 200 years ago. These schools were typically supported by local property taxes—which produce widely varying amounts of revenue from one community to the next depending on the value of real estate assets. Furthermore, the effect is often regressive, since high property values are typically found where there are wealthier residents. Although state aid to districts attempts to make up for some of these disparities, it is rarely enough

to compensate entirely for the underlying inequalities. Furthermore, relatively few states attempt to adjust for cost-of-living differentials that can greatly affect purchasing power across districts and few provide adjustments that are substantial enough for the greater needs posed by children who live in poverty, speak a language other than English, or have special educational needs.

The extent of inequality in school district funding—and the related disparities in salaries and working conditions for teachers—can be seen by comparing both actual spending data and spending levels adjusted for relative purchasing power in geographic regions that have different costs of living and distinctive labor markets. This study examines relative purchasing power by comparing districts both statewide and in individual labor markets using both adjusted and unadjusted data. Based on the previous research, we expect to find differences between districts in expenditures, teacher compensation, and working conditions. We evaluate whether these differences are regressive – that is, whether districts with larger at-risk populations have fewer resources, lower salaries, and poorer working conditions, despite the greater level of need in these districts. We hypothesize that these differences will be related to levels of teacher qualifications. Finally, we examine whether these differences in teacher qualifications are associated with differences in student achievement, holding student demographic characteristics constant. The approaches are discussed in detail below.

Methods

This study examines how district-level school expenditures influence teacher salaries and working conditions, and how these, in turn, affect the resulting supply and quality of teachers. We examine district-level disparities across states and within specific labor markets. The state level data provide a broad picture of how education funding is allocated, while data from metropolitan labor markets more accurately represent the choices that individual teachers face as they consider whether and where to teach. We adjust the financial data using the Comparable Wage Index (CWI), which measures regional differences in labor costs relative to the national average for each LEA.

We then further examine the relationships between district expenditures, teacher salaries and selected working conditions, teacher qualifications, and student achievement using both descriptive statistics (frequency distributions and bivariate correlations) and ordinary-least squares (OLS) regression. Controlling for student characteristics, we perform elasticity analyses of changes in teacher qualifications that are associated with changes in salaries and working conditions, and we use production functions to estimate how qualifications are associated with student achievement levels.

Data Sources

This study examines salary, expenditure, and teacher qualifications data from New York State and California for the 2008-09 school year, the latest available year at the time of the analysis. State agencies in both states collect and provide data at the district level in the following areas: teacher salary averages and ranges, district finances, teachers' levels of qualification and preparation, student demographics, and student achievement. In California, the California Department of Education provides data through the California Basic Educational Data System (CBEDS). The Education Data Partnership (EDP) (2009) then collaborates with the department to provide some of these data to the public in an accessible format. In New York, the state department of education provides education finance and enrollment data in the New York State Report card.

California data. The Education Data Partnership (EDP) collects salary data from California districts using the J-90 optional form. The form reports actual teacher salary data, as well as salary schedule-related data allowing comparisons that control for experience and education across districts – i.e. salaries for teachers with a Bachelor's degree and 60 credit units

with 10 years of experience. The salary variables used in this study include the minimum, average, and maximum salaries as well as salaries for teachers with the BA+60 at Step 10.[2]

In California, the form for salaries is not required by the state. In our sample, 80 percent of districts responded, accounting for 99 percent of average daily enrollment in the state. Districts not reporting salaries are quite small, usually rural districts that serve a very small percentage of students. In these cases, we used the county mean average in place of the missing district salary. We evaluated the impact of imputing using the county mean by estimating the same regressions using a dummy variable for missing data, and we found the impact to be negligible.

California expenditure data exclude capital expenditures and other major non-instructional categories. The expenditure variable is aggregated from the following expenditure categories offered by EDP: "Instructional (including regular K–12 education, adult, specialized services, supplemental education, Special Education, regional occupational center/program, and nonagency); Other goals (e.g., community services and childcare); and Undistributed" expenditures (EdSource, 2006).

These figures are used in this study, with two adjustments. First, the expenditure figure is divided by the enrollments in a district to obtain a per student figure. California defines enrollment as average daily attendance (ADA), which is calculated by:

> dividing the total number of days of student attendance by the total number of days in the regular school year. A student attending every day would equal one unit of ADA. The number of pupils enrolled in the school is usually larger than the ADA due to factors such as students moving, dropping out, or staying home because of illness. (EdSource, 2011)

After accounting for enrollment in the expenditure figures, we create an additional variable that compensates, in part, for cost-of-living and labor market differentials by adjusting the figures using the Comparable Wage Index, or CWI.[3] The CWI is also used to adjust salary figures to make salaries more comparable among school districts across the entire state. The CWI aggregates salaries from professions *other than teaching* in different districts in these states, providing a measure of the levels of compensation in that particular jurisdiction. Researchers producing the CWI then create indices based on these salary data that correspond to local education agencies (LEAs). The CWI adjustments reflect both the cost-of-living differentials that exist across a state and the fact that the composition of the labor market varies across communities. It allows greater comparability of wages and costs in expensive metropolitan labor markets (such as New York City and San Francisco) with rural and other types of school districts in which the cost of living and salaries are often substantially less expensive. In this sense, it is a good, though not perfect, measure of cost-of-living differences. For teacher salaries, it has the virtue of reflecting alternative occupational opportunities in the community, which may influence occupational entry and exit decisions.

The California Basic Education Data System (CBEDS) and the Education Data Partnership provided teacher preparation and qualification variables. Table 1 shows the specific teacher variables used in the analysis along with a brief description of each one. These data are collected on the Professional Assignment Information Form, or PAIF, and the original variables are mentioned when transformations have been changed. The CBEDS system also includes student demographic variables, such as the percent minority, percent eligible for free and reduced lunch, and percent of

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[2] Salary figures do not include benefits, due to the major differences in district benefit plans, such as single plans, family plans, cafeteria plans, etc. across districts in California.

[3] The National Center for Education Statistics calculates the CWI. Dr. Lori Taylor graciously provided the CWI for the 2008-09 school year, which NCES had not calculated for this particular year. She used the same methodology as original indices prepared for the NCES report for previous years. More information about the creation of the CWI is available at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2006865.

ELLs in each district. Table 2 includes the descriptive statistics for the key variables in our California analysis.

Table 1.
Definitions of Teacher Preparation and Qualification Variables in California

Variable	Description
Percent of teachers without credentials	The inverse of the percentage of teachers who have completed a teacher preparation program and hold a preliminary, clear professional, or life credential. Transformation of FULL_CRED variable from the PAIF.
Percent of teachers with a BA+30 or lower	The percent of teachers who have completed a Bachelors degree and 30 credit units or less of education, Transformation of ED_LEVEL variable from the PAIF.
Percent of teachers with an MA or higher	The percent of teachers who have completed a Masters degree or more of education. Transformation of ED_LEVEL variable from the PAIF.
Percent of newly-hired teachers	The percent of first-year teachers.
Percent of teacher with fewer than 3 years experience	Cumulative total of the percent of first-year teachers and the percent of second-year teachers.
Percent of teachers without tenure	Transformed from the STATUS variable from the PAIF that indicates whether the teacher's position is tenured, probationary, or long-term substitute or temporary employee.
Average number of years of teaching experience	"Total years of public and/or private educational service. Includes services in this district, other districts, other states, and countries. Does not include substitute teaching or classified staff service. The first year of service is counted as 1 year."

Sources: California Basic Educational Data System, 2009; Education Data Partnership (California), 2009.

New York data. Data for New York come from two sources. The state office provides a New York State Report Card, and additional requests for specific variables were made to the New York education information and reporting service. Teacher salaries in New York districts are reported using percentiles instead of averages or levels of education. We use data on salaries in New York at the 5th, 50th (median), and 95th percentiles, which provide a reasonable sense of the salary schedule range. This metric is partly influenced by teacher experience, but there are few districts that do not have a range of teacher experience from novices to senior veterans. In New York, fewer than 3 percent of districts had missing salary data. As in California, when data were not available, teacher salary figures were imputed using the county mean. Also, an additional variable was developed adjusting teacher salaries using the CWI measure.

New York provides an extended list of the eight categories used in the instructional expenditure calculation from its financial analysis and research unit (New York Fiscal Analysis and Research Unit, 2010). The instructional expenditure variable in this study includes expenditures on salaries and benefits. To calculate the expenditure per capita figure, the enrollment in each grade from Pre-kindergarten to 12th grade was summed and the instructional expenditure figure divided by enrollment. Finally, the expenditure per capita figure was adjusted using the CWI measure. New York collects more data on teacher preparation and qualification than California. Table 3 shows the different teacher variables along with their names and descriptions from the New York State Report Card, when applicable. Table 4 includes the descriptive statistics for the key variables in our New York analysis.

Table 2.

Distribution of Salaries, Expenditures, Qualifications, and Student Demographics in California School Districts
(Teacher salaries and expenditures CWI-adjusted with missing values imputed using county averages.)

Variables	Minimum	5th percentile	District average (SD)	95th percentile	Maximum	Sample size
Minimum salary (actual)	$27,084	$34,002	$40,206 (4,272)	$47,851	$61,184	966
Minimum salary (CWI adjusted)	$29,515	$36,602	$46,308 (8,150)	$63,468	$90,776	966
Average salary (actual)	$36,749	$51,095	$62,306 (7,976)	$75,272	$95,365	966
Average salary (CWI adjusted)	$41,947	$54,952	$71,535 (12,167)	$96,178	$124,383	966
Maximum salary (actual)	$45,583	$62,655	$78,798 (10,116)	$96,040	$119,657	966
Maximum salary (CWI adjusted)	$53,986	$71,293	$90,302 (14,428)	$120,219	$158,376	966
Relative Minimum salary (actual)	68.31	86.92	100 (7.57)	112.85	130.58	966
Expenditures/pupil (actual)	$6,032	$7,245	$10,234 (4,969)	$18,025	$69,616	967
Expenditures/pupil (CWI adjusted)	$6,183	$7,465	$12,104 (7,221)	$23,541	$79,513	967
Average daily attendance	5	35	5822 (21,306)	22593	595701	955
% Teachers without Credentials	0	0	5.13 (5.66)	15	50	967
% Teachers with BA or lower	0	0	9.97 (11.79)	32	100	967
% Teachers with MA or higher	0	8	35.00 (17.61)	66	100	967
% Newly Hired Teachers	0	0	4.10 (5.72)	14	50	967
% Teachers under 3 years experience	0	0	9.54 (9.05)	27	60	967
% Teachers without tenure	0	12	35.78 (24.71)	100	100	967
Mean years of teaching experience	1	5	10.28 (3.03)	15	27	967
Average class size	1	11.6	22.27 (5.01)	27.8	32.6	966
District % free/ reduced lunch	0	4.4	48.96 (26.42)	90.6	100	967
District % minority	0	9.2	49.83 (28.99)	96.2	100	967
District % ELL	0	0	19.48 (18.41)	56.9	100	967

Sources: California Basic Educational Data System, 2009; Education Data Partnership (California), 2009.

Table 3.

Definitions of New York Teacher Preparation and Qualification Variables

Variable	New York dataset variable name	Description
Percent of teachers without a permanent credential	Provided by data request.	The inverse of the percentage of teachers who have a permanent teaching certification.
Percent of teachers with a BA+30 or lower	Provided by data request.	The percent of teachers who have completed a Bachelors degree and 30 credit units or less of education.
Percent of teachers with an MA or higher	Provided by data request.	The percent of teachers who have completed a Masters degree or more of education.
Percent of teacher with fewer than 3 years experience	PER_FEWER_3YRS_EXP	Percent of teachers with fewer than three years of teaching experience
Average number of years of teaching experience	Provided by data request.	New York state provides these figures based on five-year intervals, e.g., percent of teacher with 1-5 years, etc. To obtain a district average, the number of teachers was multiplied by the average number of years. These figures were summed for a total number of years of experience in a district, then divided by the number of full-time teachers for an average years of experience figure at the district level.
Percent teacher turnover	PER_TURN_ALL	Turnover rate of all teachers
Percent of teachers with provisional certification	Provided by data request.	Percent of teachers with provisional teaching certification
Percent of teachers with no certification	Provided by data request.	Percent of teachers with no teaching certification
Percent of teachers with other certification	Provided by data request.	Percent of teachers with an other type of teaching certification
Percent of teachers with no valid certificate	PER_NO_VALID_CERT	Percent of teachers with no valid teaching certificate
Percent of teachers out of certification	PER_TEACH_OUT_CERT	Percent of individuals teaching out of certification
Percent of classes without a highly qualified teacher (HQT)	PER_NOT_HQ	Percent of core classes not taught by highly qualified teachers
Percent of classes taught without appropriate certification	PER_NO_APPROP_CERT	Percent of classes taught by teachers without appropriate certification

Source: New York State Education Department, 2009.

Table 4.
Minimum, 5th Percentile, Median, 95th Percentile, and Maximum Values and Standard Deviations for Variables in New York School Districts (Teacher salaries and expenditures CWI-adjusted with missing values imputed using county averages.)

Dependant and Independent Variables	Minimum	5th percentile	District average (SD)	95th percentile	Maximum	Sample size
5th Percentile salary (actual)	$13,232	$32,370	$43,132 (9312)	$61,338	$77,041	727
5th Percentile salary (CWI adjusted)	$17,060	$40,082	$49,282 (7083)	$60,108	$71,729	727
Median salary (actual)	$39,548	$43,900	$61,967 (17532)	$95,786	$118,636	727
Median salary (CWI adjusted)	$48,230	$54,565	$70,085 (12167)	$93,409	$107,893	727
95th Percentile salary (actual)	$24,939	$63,249	$86,992 (19905)	$121,550	$135,539	727
95th Percentile salary (CWI adjusted)	$34,416	$80,738	$98,929 (13179)	$119,574	$135,951	727
Relative minimum salary (adjusted)	34.7	92.91	108.1 (17.08)	132.7	321.03	727
Expenditures/pupil (actual)	$8,542	$10,128	$14,228 (4232)	$20,763	$54,080	727
Expenditures/pupil (CWI adjusted)	$10,416	$12,395	$16,297 (4221)	$22,677	$59,170	727
Total enrollment attendance	9	241	3605.3 6538.28	12,434	56,668	727
% Teachers without Permanent Credential	0	8.1	18.18 (8.16)	34.3	58.8	727
% Teachers with BA or lower	0	3	11.22 (6.00)	23	36	727
% Teachers with MA or higher	64	77	88.79 (6.00)	97	100	727
% Teachers under 3 years experience	0	2	7.92 (4.32)	16	33	727
Years of teaching experience	7	11.6	14.61 (1.99)	17.6	28	727
% Teacher turnover	0	3.6	9.27	17.6	27.3	726
% Teachers with provisional certification	0	7.5	16.3 (6.5)	28.6	41.7	727
% Teachers with no certification	0	0	1.1 (2.1)	5	17.6	727
% Teachers with other Certificate	0	0	0.7 (1.5)	3.2	15.8	727
% Teachers out of certification field	0	0	2.8 (3.6)	11	35	727
% Classes without Highly Qualified Teachers	0	0	2.5 (3.8)	11	27	727
% Classes taught without appropriate certification	0	0	3.4 (3.6)	11	29	727

Table 4. (continued)
Minimum, 5th Percentile, Median, 95th Percentile, and Maximum Values and Standard Deviations for Variables in New York School Districts (Teacher salaries and expenditures CWI-adjusted with missing values imputed using county averages.)

Dependant and Independent Variables	Minimum	5th percentile	District average (SD)	95th percentile	Maximum	Sample size
Average class size	2	13.8	19.28 (3.45)	24.2	28.7	723
District % free/ reduced lunch	0	2	31.57 (21.60)	73	100	727
District % minority	0	1	22.11 (29.89)	100	100	727
District % ELL	0	0	2.43 (4.94)	13	38	727

Source: New York State Education Department, 2009.

Elasticity Analysis and Production Functions

After creating datasets for each state, we use two regression approaches to identify the relationships between teacher salaries and other variables: elasticity analysis of the determinants of teacher qualifications and production functions examining the predictors of student achievement measures. We replicate the approach used by Pogodzinski (2000) to model the elasticity of the relationship between teachers' salaries and credentials. An elasticity regression, estimated with data transformed logarithmically, provides the percent change in the dependent variable given a one percent change in the independent variable. In this study specifically, the results shows what percentage change in teacher qualifications is associated with a one percent change in teacher salaries and other independent variables, controlling for student demographic variables known to influence achievement outcomes.

Production functions originate from economic studies of production in firms that measure the effect of a given set of inputs upon a defined output (Carnoy, 1995). In this study, student achievement serves as the output dependent on investment in teachers through salary and hiring practices, controlling for demographics such as student race, poverty, and language background, which typically account for a large proportion of the variation in student achievement outcomes. We use ordinary least squares (OLS) regression to model these relationships.

As a measure of student achievement, we used New York data on levels of student performance in English/language arts and mathematics within each district. Level 4 corresponds to the highest level of student proficiency; level corresponds 1 to the lowest. California provides data on the percentage of students meeting the California Standards Test proficiency standard in both English/language arts and mathematics in school districts. It also provides data on the state Academic Performance Index (API), which is a composite measure of test scores in English language arts, mathematics, science, and social studies, as well as graduation rates.

Results

Inequality in California

California was once known as relatively equalized after the *Serrano* school finance lawsuit in 1965, which judged the school funding system unconstitutional and imposed a new funding formula. Since then, however, disparities in funding have grown substantially. Following the passage of

Serrano-inspired legislation that sharply reduced funding inequalities, a cap on property taxes passed in 1979, known as Proposition 13, set the stage for three decades of eroding funding levels coupled with growing inequality.

California now spends considerably less than the national average per pupil, although it has among the highest costs of living in the nation. Furthermore, the range of instructional expenditures now exceeds a 3 to 1 ratio between low- and high-spending districts, both on an adjusted and unadjusted basis. This is true even when the highest-spending districts, which are often quite small, sparsely populated, or otherwise unusual, are excluded from the analysis. Using the 95th percentile district as the top of the scale to eliminate the atypical outliers, unadjusted spending per pupil ranges from about $6,000 to $18,000. Strikingly, adjusted spending shows an even wider gap, ranging from about $6,100 to $23,500 per pupil—a ratio of nearly 4 to 1 (Table 5).

Table 5.
Range of California Salaries, 2008-09

Salary schedule level	Range of salaries (county, district)		Range of adjusted salaries (county, district)	
	From	To	From	To
Lowest Salary	$27,085 (Mendocino County, Willetts Unified)	$61,184 (Mountain View-Los Altos HSD, Santa Clara County)	$29,515 (Contra Costa County, Orinda Elementary)	$90,776 (Glenn County, Brawley Union High)
BA+60, Step 10	$42,143 (Humboldt County, Bridgeville Elementary)	$100,962 (San Mateo County, Las Lomitas Elementary)	$41,141 (Marin County, Union Joint Elementary)	$117,691 (Glenn County, Willows Unified)
Highest Salary	$45,583 (Humboldt County, Bridgeville Elementary)	$119,657 (Monterey County, King City Joint Union High)	$53,986 (Marin County, Lincoln Elementary)	$158,376 (Monterey County, King City Joint Union High)

Source: Education Data Partnership (California), 2009.

Statewide, salaries for comparably educated and experienced teachers varied by a ratio of more than 2 to 1 in 2009. Comparisons to earlier data show that these differentials grew noticeably since the year 2000 (Darling-Hammond, 2002). Even more stunning is that the range of teacher salaries *increases* after labor market adjustments: High-salary districts spend more than twice as much as low-salary districts for beginning teachers (see Figure 1) and 3 times more for more experienced teachers with similar experience and education levels (see Table 5.) For example, for a teacher with 10 years of experience and a bachelor's degree plus 60 additional education credits (about the median point on the salary schedule for teachers), adjusted salaries ranged from $41,000 to over $117,000 across the state.
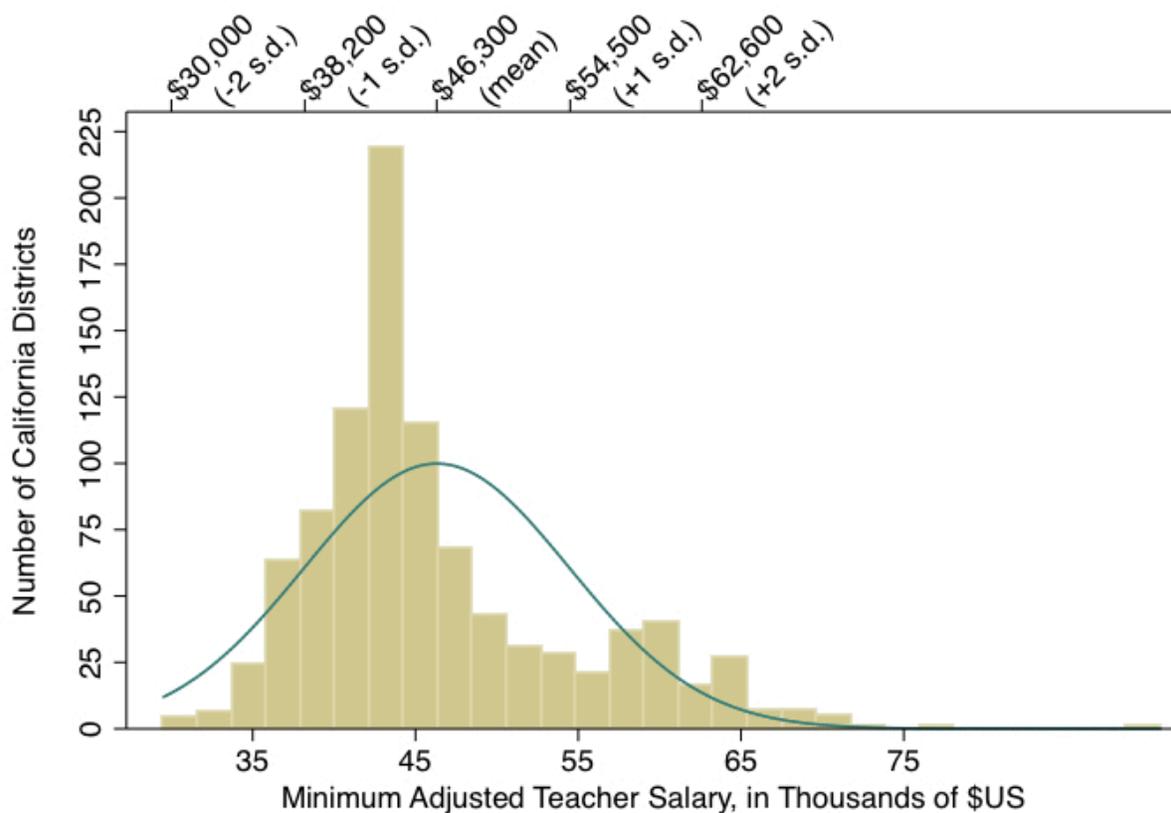
Figure 1. Range Of California District Minimum Teacher Salaries (Adjusted), Mean And Standard Deviation, 2008-09.
Source: Education Data Partnership (California), 2009.

Teachers' wages vary considerably across schools districts even within the same county or labor market. In the San Francisco Bay area (including the city and Alameda and San Mateo Counties -- the two closest, most populous counties that are within easy commuting range by both car and public transportation), average salaries range from about $54,000 in Oakland, which serves a majority of low-income students of color, to about $90,000 in wealthy, predominantly white Portola Valley, home of many Silicon Valley industrialists (see Figure 2.).[4] Beginning teachers in wealthy Pleasanton could earn minimum salaries more than $20,000 higher than they could in lower-wealth Union Elementary, which serves a much higher share of needy students, and the disparities in teachers' pay grow as they gain greater experience. Oakland and San Francisco fall near the bottom of the distribution of entry-level pay, below the state average, while suburban districts serving the most advantaged students are found near the top (see Figure 3.)

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[4] Figure 2 shows unadjusted salaries, because those are arguably more salient to teachers within this roughly 45 minute commuting radius; however, the same patterns exist when we adjust for the relatively small cost-of-living differentials within this region.
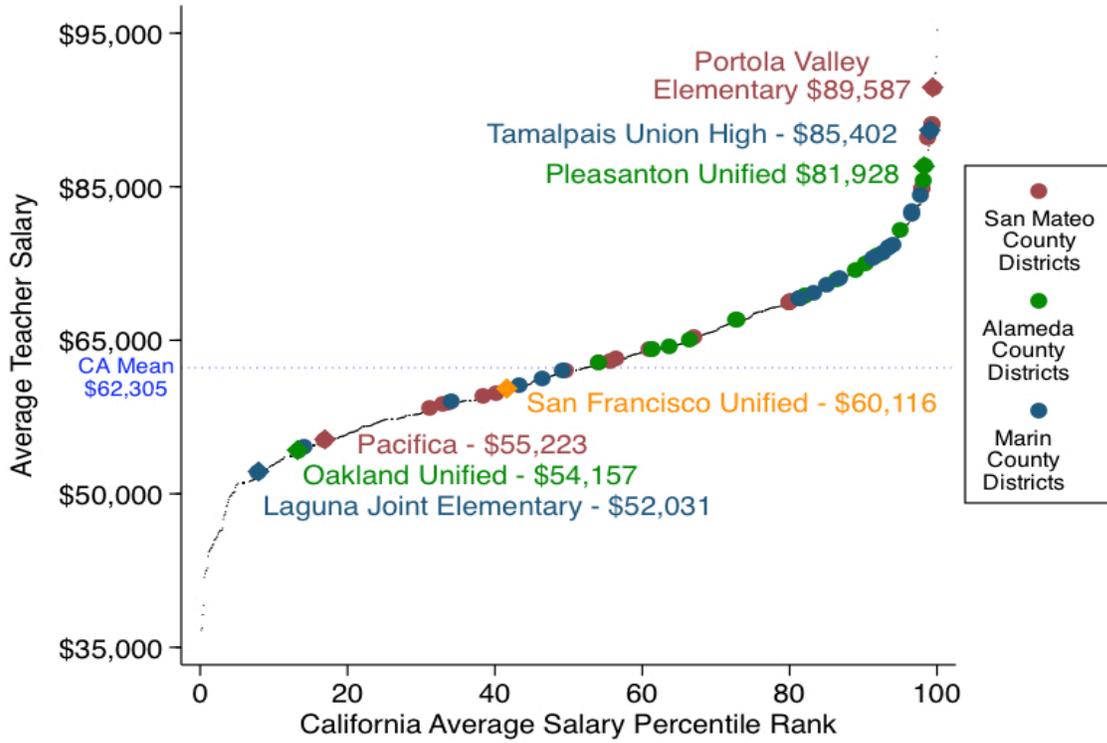
Figure 2. San Francisco Bay Area Labor Market Distribution of Average Teacher Salaries, By District in 2008-09.
Source: Education Data Partnership (California), 2009.
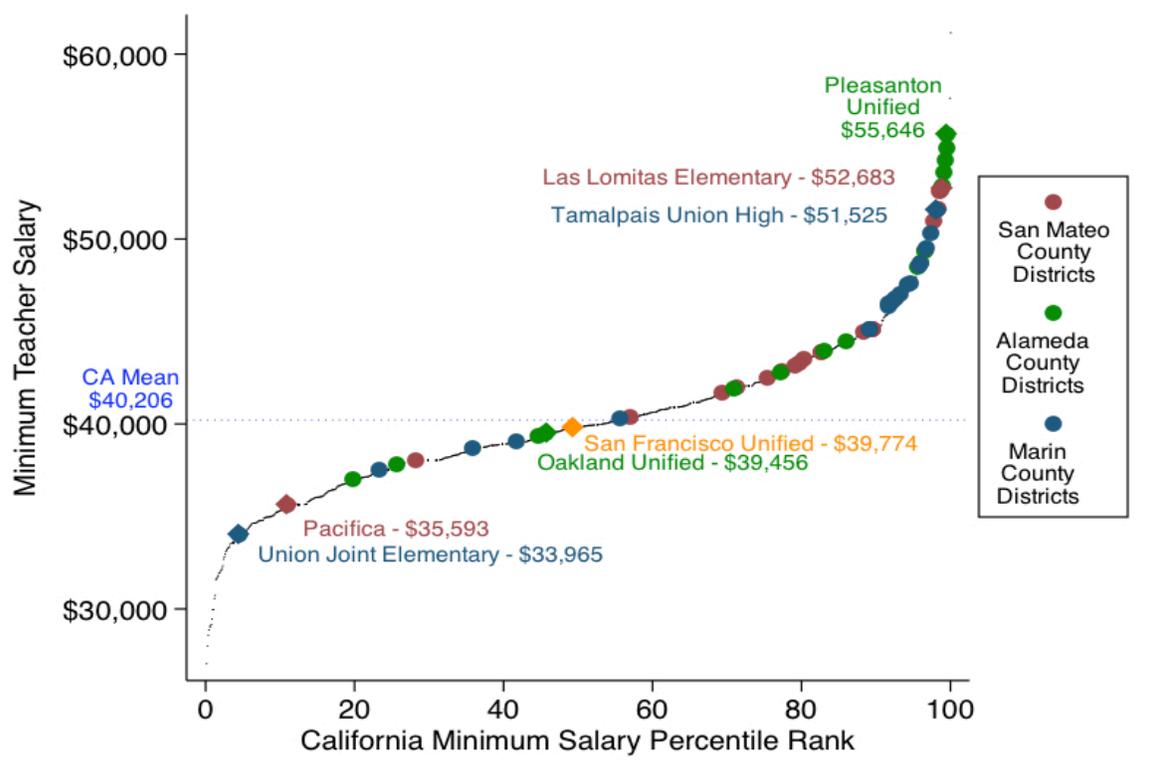
Figure 3. San Francisco Bay Area Labor Market Distribution of Minimum Teacher Salaries,
By District in 2008-09.
Source: Education Data Partnership (California), 2009.

An analysis by economist Michael Pogodzinski (2000) found similar wage disparities a decade ago, which he discovered were a significant factor in explaining the prevalence of teachers teaching on emergency permits and waivers in districts paying below the labor market wage. As Pogodzinski (2000) found then, the range of teacher qualifications across districts continues to be quite large (see Table 6 and Figure 4.) While the average California district has relatively few teachers who are inexperienced or uncredentialed, there are a number of districts where such novice teachers constitute a large share of the teaching force, sometimes as much as half or more.

Table 6. *Minimum, Average, and Maximum Values for Teacher Preparation and Qualification Variables in California School Districts*

Variables	Minimum	Average	Maximum	Sample size
% Teachers without credentials	0	5.1	50.0	967
% Teachers with BA or lower	0	10.0	100	967
% Teachers with MA or higher	0	35.0	100	967
% Newly hired teachers	0	4.1	50.0	967
% Teachers under 3 years experience	0	9.5	60.0	967
% Teachers without tenure	0	35.8	100	967
Average number of years of teaching experience	1	10.3	27.0	967

Sources: California Basic Educational Data System, 2009; Education Data Partnership (California), 2009.
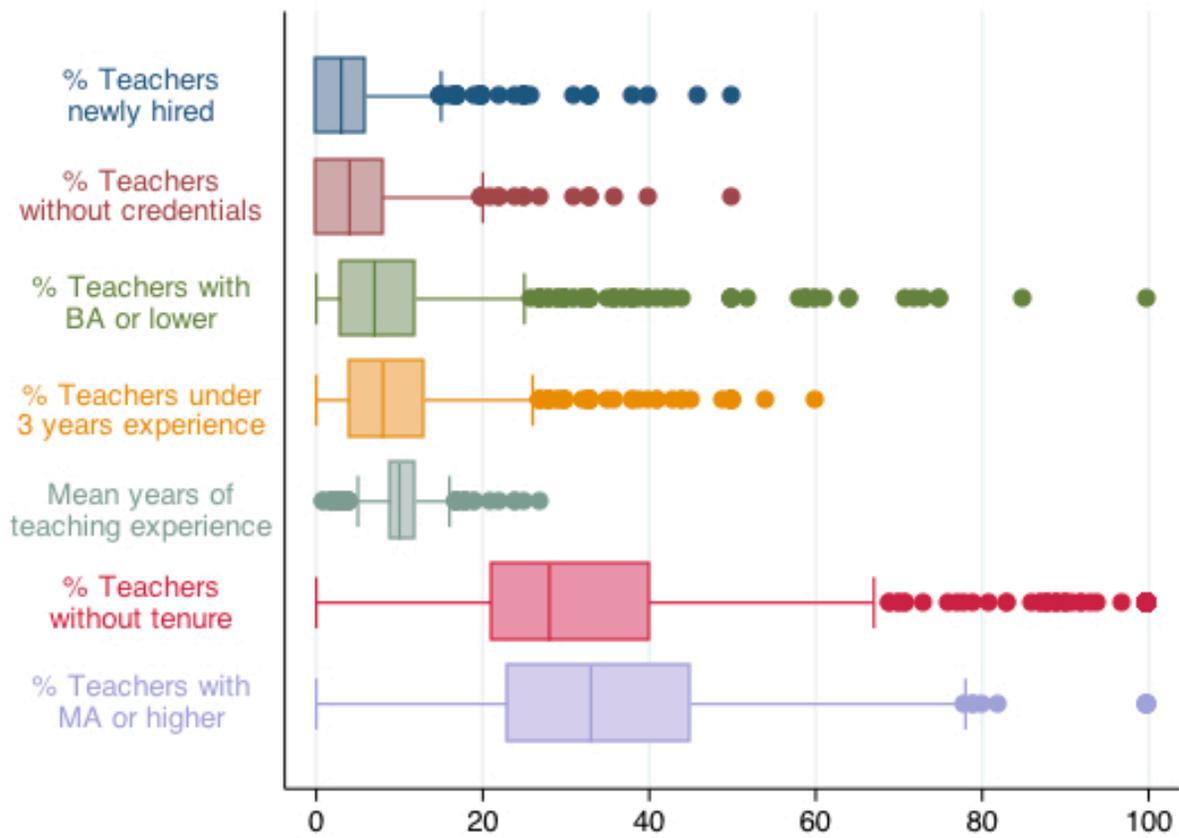
Figure 4. Teacher Preparation, Qualification, and Years of Experience in California, By District in 2008-09.
Source: Education Data Partnership (2009).

      Figure 4 shows, for example, that while the percentage of teachers without credentials averages about 5 percent, and is less than 10 percent in most districts (those between the 25th and 75th percentiles, represented by the area shown inside the boxplot), there are some districts with as many as 50 percent of their teachers uncredentialed (represented by the dots beyond the box). Similarly, while districts average about 9.5 percent of their teachers with less than three years of experience, and most have between about 3 percent and 13 percent, some districts have as many as 60 percent of their teachers with less than three years of experience.

      Which districts offer the least competitive teacher salaries and have the least well-qualified teaching staffs? Low-salary districts disproportionately serve much larger proportions of students of color and ELLs than districts offering the most competitive salaries (see Figure 5). And, whereas teacher salaries are traded off against class size in the development of budgets, the lowest-salary districts have class sizes that are nearly 20 percent larger than the highest-salary districts, signaling that these districts likely have fewer available resources for instruction overall.
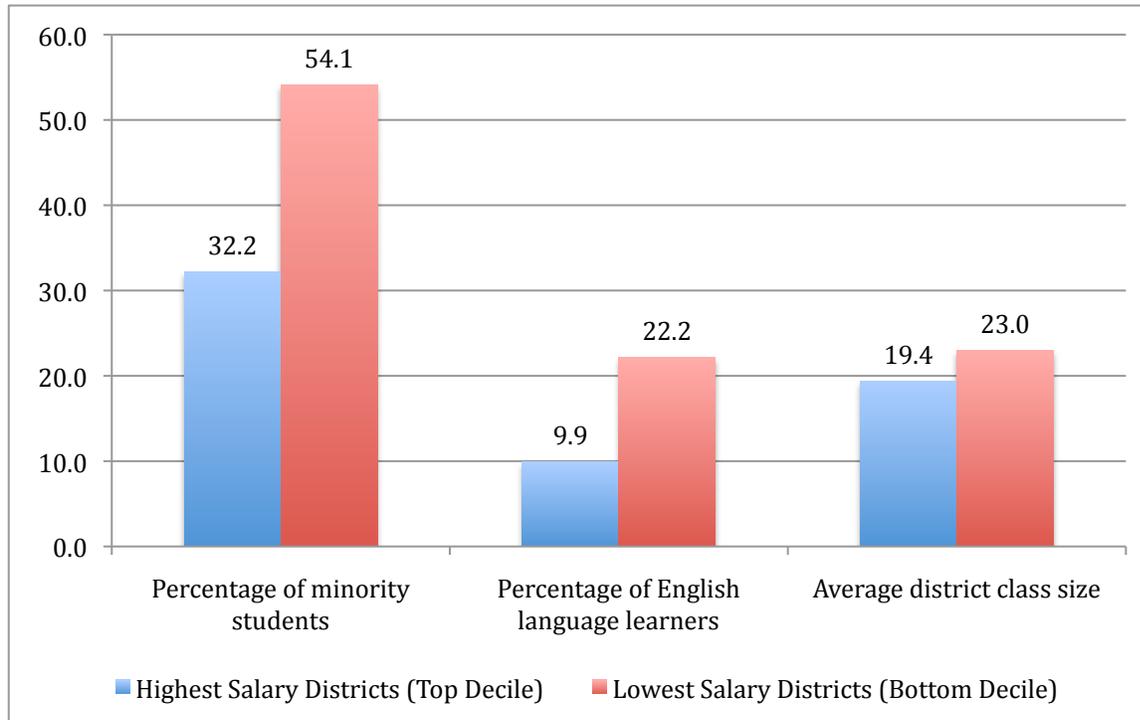
Figure 5. Characteristics of Low- and High-Salary Districts in California (Minimum Adjusted Salary). Source: Education Data Partnership (2009).

As a consequence, those districts serving the highest proportions of minority students have about twice as many uncredentialed and inexperienced teachers as do those serving the fewest (see Figure 6). They have higher turnover, as suggested by the percentage of teachers newly hired in a given year, and their teachers have lower levels of education. The same trends are apparent in districts serving concentrations of children in poverty (see Figure 7).
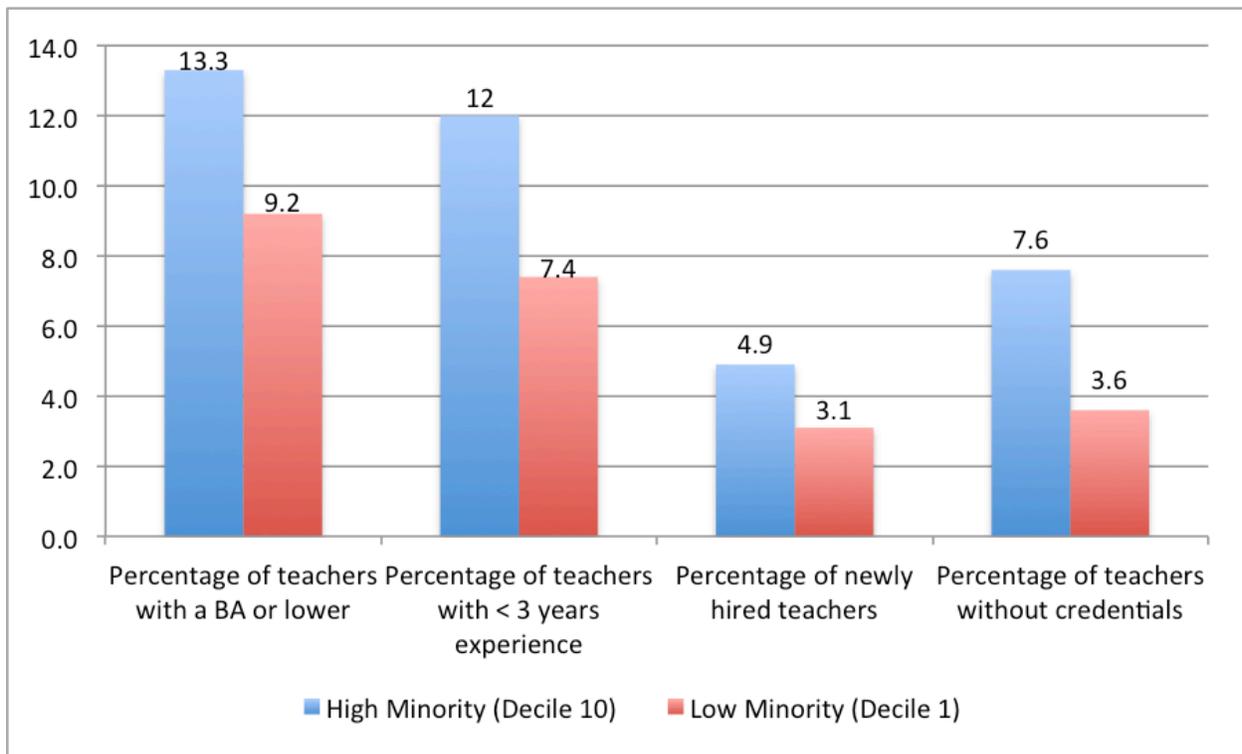
Figure 6. Teacher Quality in High- and Low-Minority Districts in California.
Sources: California Basic Educational Data System, 2009; Education Data Partnership (California), 2009.
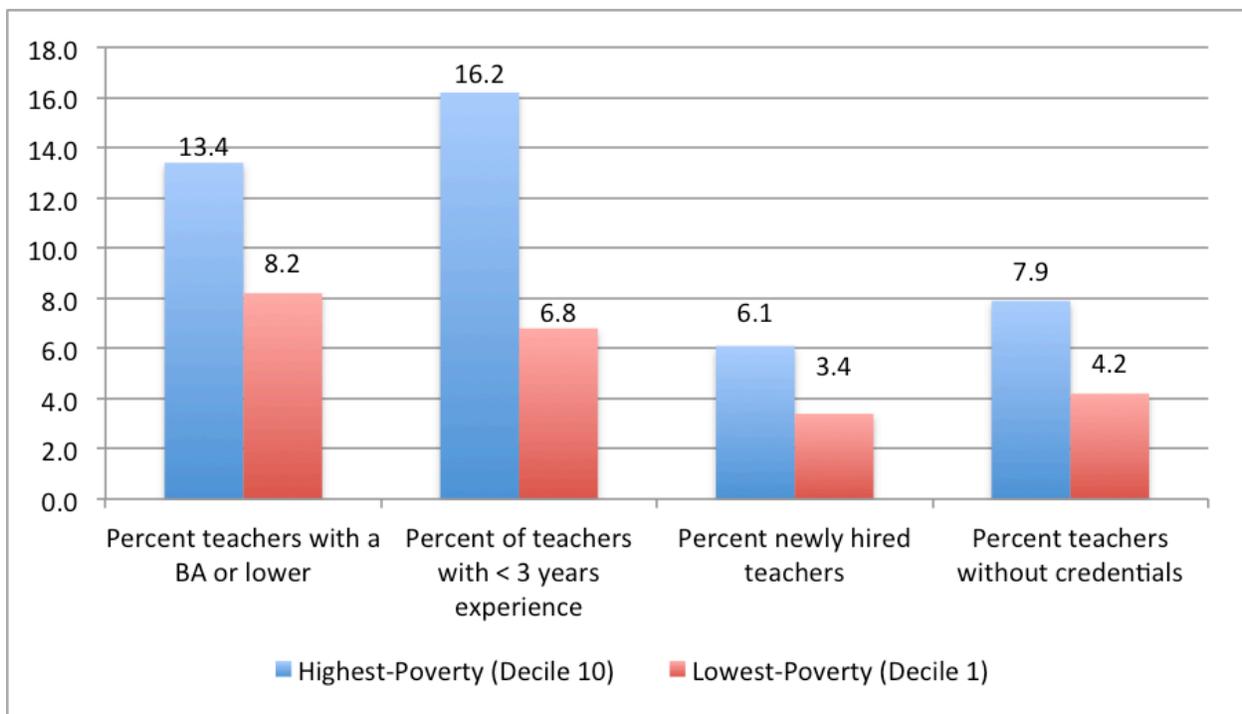
Figure 7: Teacher Quality in High- and Low- Poverty Districts in California (Percent of Students Eligible for Free and Reduced Price Lunch)
Sources: California Basic Educational Data System, 2009; Education Data Partnership (California), 2009.

Inequality in New York

The range of disparities is also large in New York. Although New York State has experienced some recent equalization since the *Campaign for Fiscal Equity v. State of New York* (2003), a school finance lawsuit decided in 2003, very substantial inequalities persist. In 2008-09, districts' per pupil expenditures ranged from $8,500 to $20,700 at the 95th percentile (and over $54,000 at the very top of the range). Even adjusted for cost differences, the range is equally large: from about $10,400 per pupil at the bottom of the distribution to $22,700 at the 95th percentile and over $59,000 at the top (Table 4).

Meanwhile, even excluding districts at the very low and high end of the range (districts below the 5th and above the 95th percentiles), beginning teacher salaries ranged from $32,370 to $61,338, and median salaries ranged from $43,900 to $95,786, a more than 2 to 1 ratio.[5] Table 7 shows that disparities remain large even after adjusting for labor market differences (see Tables 3-4 for more detailed data).

Table 7.
Range of New York Salaries, 2008-09 (Districts at the 5th and 95th Percentiles)

Salary level	Range of salaries (county, district)		Range of adjusted salaries (county, district)	
	From	To	From	To
5th Percentile Salary	$32,370 (Lewis County, Harrisville Central School District)	$61,338 (Nassau County, Herricks Union Free School District)	$40,082 (Greene County, Hunter-Tannersville Central School District)	$60,108 (Nassau County, Bellmore Union Free School District)
Median Salary	$43,900 (Madison County, Stockbridge Valley Central School District)	$95,786 (Putnam County, Carmel Central School District)	$54,565 (Otsego County, Gilbertsville-Mount Upton Central School District)	$93,409 (Nassau County, North Shore Central School District)
95th Percentile Salary	$63,249 (Otsego County, Richfield Springs Central School District)	$121,550 (Suffolk County, Montauk Union Free School District)	$80,738 (Onondaga County, Jordan-Elbridge Central School District)	$119,574 (Suffolk County, Montauk Union Free School District)

Source: New York State Education Department, 2009.

As in California, salary disparities are substantial within a given labor market, illustrating the choices teachers must make when they are deciding where to teach. As Figures 8 and 9 show, both median and beginning salaries for districts in Nassau County (the nearest county to the east of New

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[5] New York collects salary data for the 5th and 95th percentile *teachers* in each district, rather than using a standardized salary scale. Because some outlier districts may have disproportionate numbers of beginning teachers, on the one hand, or highly experienced teachers on the other, which can skew comparisons, in this table we present data from the 5th and 95th percentile districts in New York, to eliminate the extreme outliers.

York City, on Long Island), while themselves disparate, are substantially higher than New York City salaries, right next door. Median salaries in Nassau are so much higher than those in the city that they do not even overlap with the salaries of any of the local New York City districts.

Within Nassau County, the lowest median salaries are paid in Roosevelt Union School District, one of the closest districts to New York City, which serves 100 percent minority students. The highest salaries are paid in suburban districts such as Jericho Union, which is predominantly white and has less than 1 percent of its students living in poverty. The same kinds of differentials exist between New York City and affluent Westchester County, its neighbor to the north.
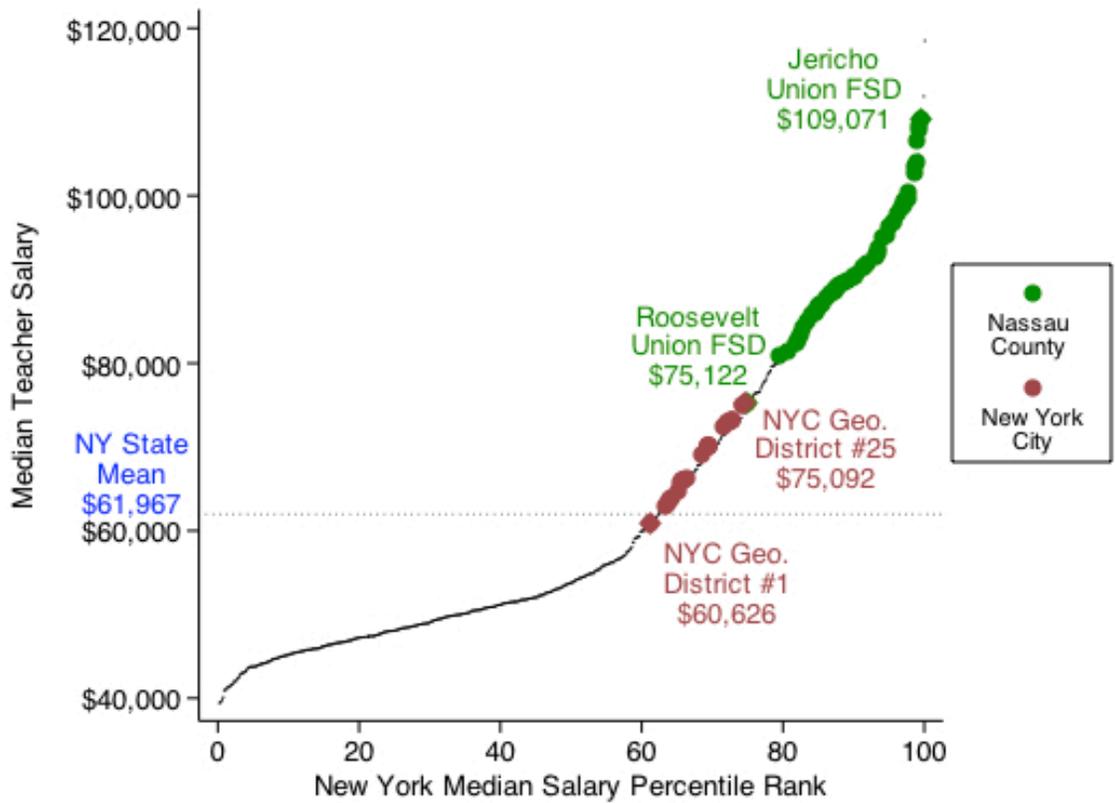
Figure 8. New York Distribution of Median Teacher Salaries, By District in 2008-09.
Source: New York State Education Department, 2009.
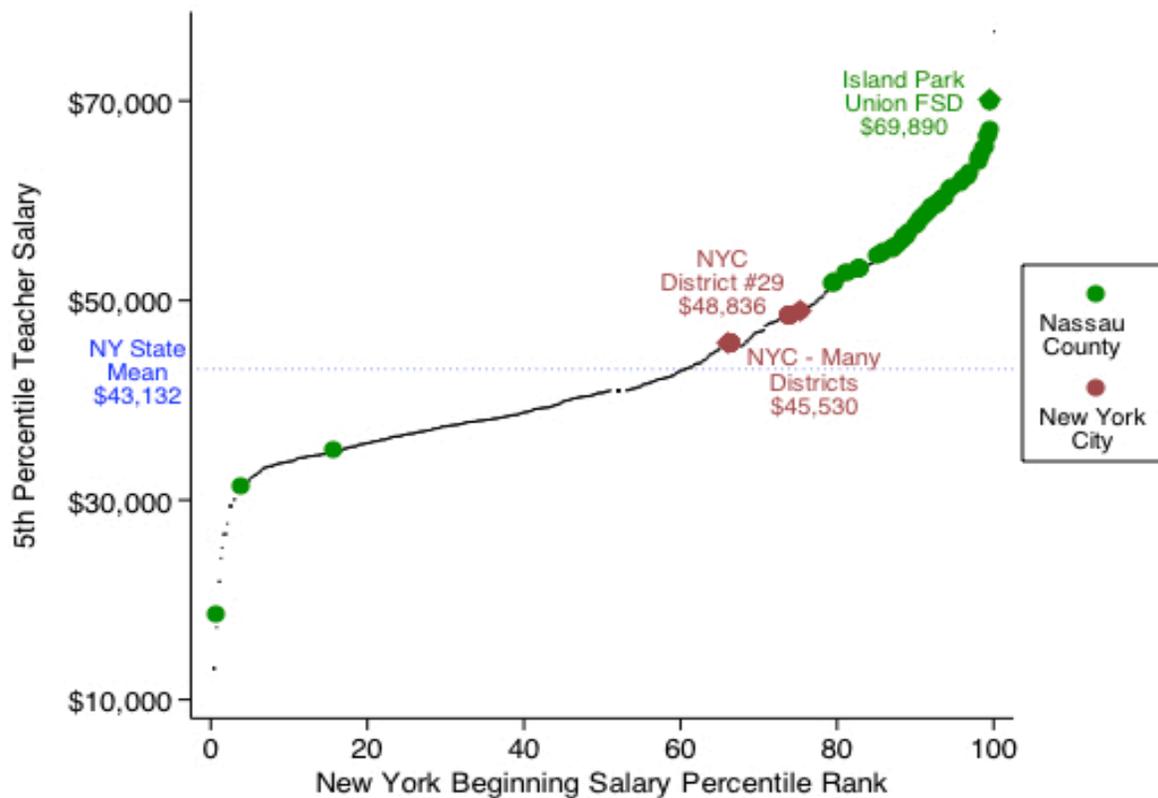
Figure 9. New York Distribution of 5th Percentile Teacher Salaries, By District in 2008-09.
Source: New York State Education Department, 2009.

How Disparities in Salaries and Working Conditions Affect School Staffing

In his book, *The Shame of a Nation,* Jonathan Kozol noted that, in 2003, median teacher salaries in New York City were $53,000 as compared to $95,000 in suburban Scarsdale – a function of dramatically different salary schedules as well as levels of teachers' experience and education. He described teaching conditions in a middle school in Harlem serving African American and Hispanic students, 70 percent of whom scored at the lowest level on the state's achievement tests:

The school… turned out to be a bleak and grimy institution on the top floor of an old five-story building in East Harlem…. Class size averaged 30 students…. Thirteen of the 15 teachers were "provisionals," which meant they were not fully certified to teach. Supplies were scarce. "Three of my classes don't have textbooks," said the principal. "I have to fight and scratch for everything we get."… "If we had the money, ideal class size for these kids would be 15 to 20," said a teacher. "Many are in foster care – their parents may have died of AIDS or are in jail." But even if they had the money for more teachers, said the principal, "we wouldn't have the space," and he unlocked a door to show me that his social studies teacher had to use a storage closet as her office. Standards posters, lists of numbered mandates, lists of rubrics lined most of the classroom walls. I asked a mathematics teacher if these lists had pedagogic value for his students. "District wants to see it, wants to know I'm teaching this," the teacher answered, rather dryly. When I asked him how he'd found a job in this academy, he told me he had been in business – "real estate, insurance" – for nine years, then for some reason (I believe he lost his job) he needed to find work. "A friend said,

'Bring your college transcript in.' I did. They sent me to the district. The next day I got the job…." (Kozol, 2005, p. 142-43)

Although a school finance lawsuit triggered additional funding for New York City, the state has recently reneged on its commitment, and disparities in teaching incentives remain stark. With median salaries in Scarsdale having climbed to $118,636 by 2009, compared to New York City's $60,626, it is not surprising that Scarsdale had no teachers teaching without certification in their field in that year, while the East Harlem district Kozol wrote about had 12 percent of its teachers teaching doing so, and 28 percent of deemed not "highly qualified" under No Child Left Behind.[6] While nearly 25 percent of East Harlem's teachers were inexperienced, the proportion in Scarsdale was only 2 percent. Class sizes averaged 25 in East Harlem and 19.5 in Scarsdale. And, of course, 80 percent of the children in East Harlem were poor and 100 percent were minority, while no children in predominantly white Scarsdale lived in poverty.

Of course, these differentials influence teachers' decisions about where to teach. As in California, the characteristics of students and teachers are very different in low- and high-salary districts across the state. Districts with the lowest adjusted salaries have more than twice as many low-income students, teachers without a permanent credential, inexperienced teachers, and teachers with lower levels of education (see Figure 10).

Also, as in California, there is a substantial range in the qualifications of teachers across districts (see Table 8 and Figure 11). It is important to note, though, that the qualifications of New York State teachers are generally higher than those in California, and fewer schools are egregiously understaffed. In part as a result of the CFE lawsuit and related court actions, and in part because of state education spending and licensure reforms, there are fewer inexperienced and uncertified teachers in New York, overall, and there are no districts in New York with as intense a concentration of novices and untrained teachers as there are in California. Whereas some California districts have half or more of their teachers working without experience or training (a situation that once characterized some community districts in New York City), the most impacted New York districts now have fewer than 20 percent of their teachers in this category. While disparities remain a troubling issue, recent New York history shows that it is possible to make noticeable progress toward improvements in a relatively short period of time.

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[6] Recent data are from the New York data set assembled for this project.
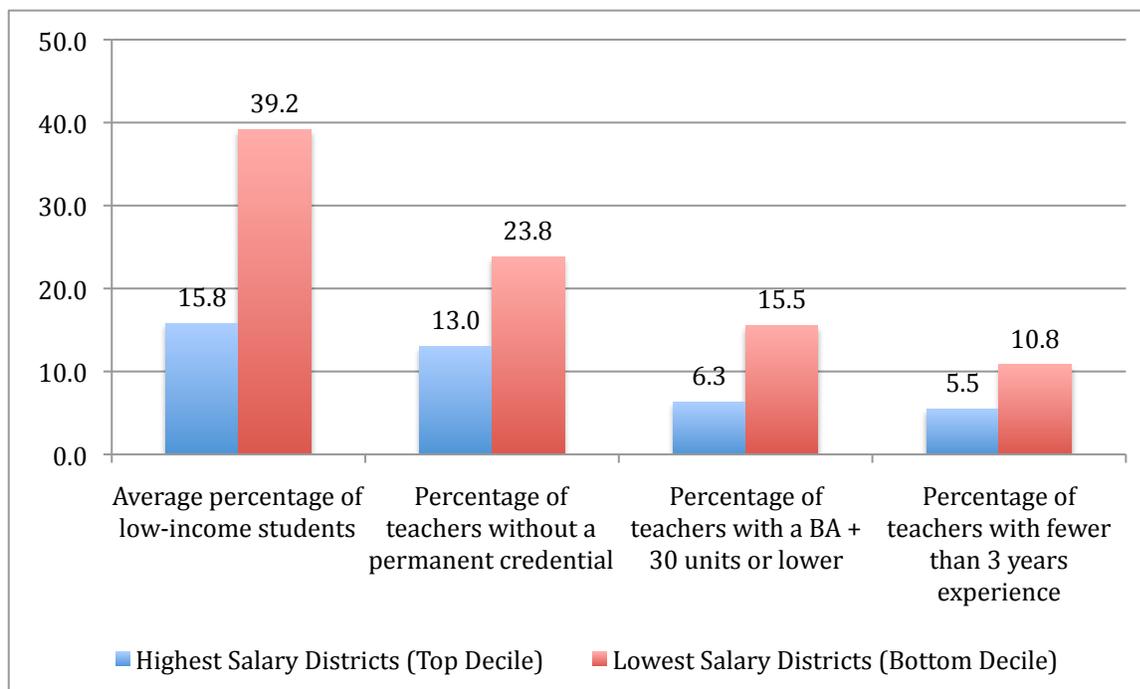
Figure 10. Characteristics of High- and Low-Salary Districts in New York (Average Adjusted Salary)
Source: New York State Education Department, 2009.

Table 8.
Minimum, Average, and Maximum Values for Teacher Preparation and Qualification Variables in New York School Districts

Dependant and independent variables	Minimum	Average	Maximum	Sample size
% Teachers without Permanent Credential	0	18.2	58.8	727
% Teachers with BA +30 or lower	0	11.2	36	727
% Teachers with MA or higher	64	88.8	100	727
% Teachers under 3 years experience	0	7.9	33	727
Average number of years of teaching experience	7	14.6	28	727
% Teacher turnover	0	9.3	27.3	726
% Teachers with provisional certification	0	16.3	41.7	727
% Teachers with no certification	0	1.1	17.6	727
% Teachers with other certificate	0	0.7	15.8	727
% Teachers out of certification field	0	2.8	35	727

Source: New York State Education Department, 2009.
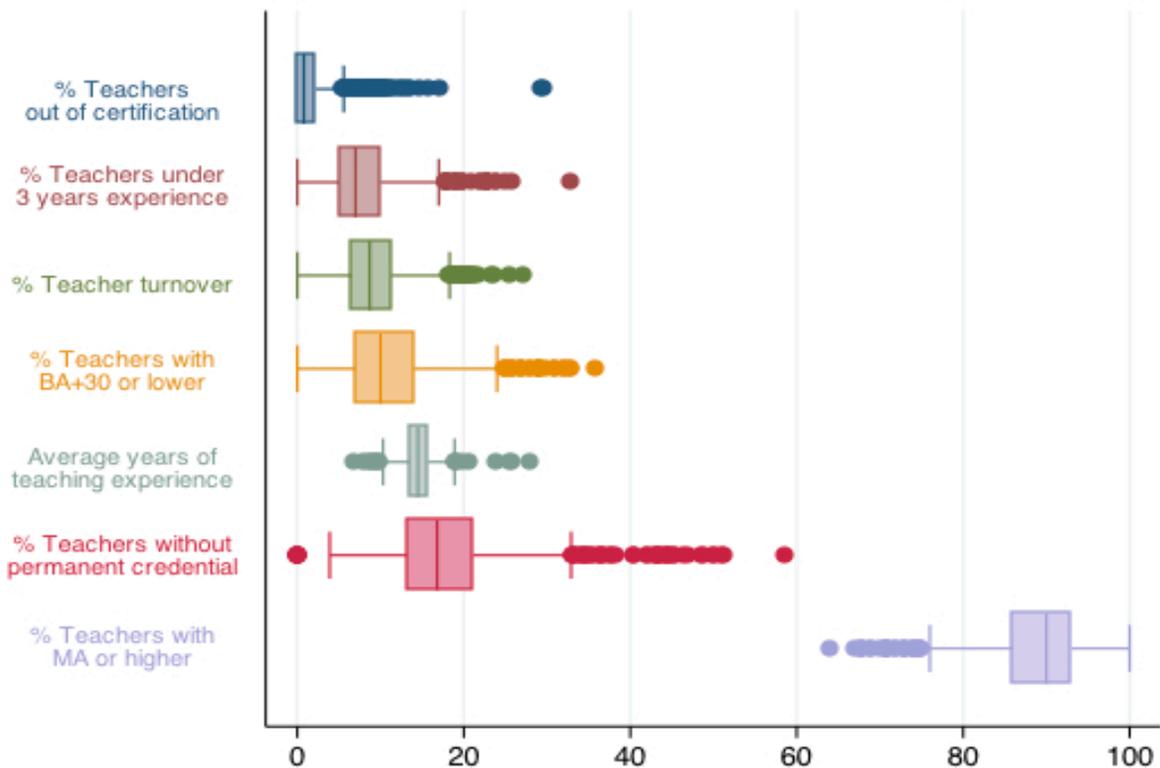
Figure 11. Teacher Qualifications in New York State, By District in 2008-09.
Source: New York State Education Department, 2009.

How Do Salaries Influence Teacher Quality and Student Learning?

To examine how changes in salary levels could influence the distribution of teacher qualifications, we conducted an elasticity analysis to examine the percentage change in specific teacher qualifications associated with a percentage change in teacher salaries, controlling for other factors that have been found to influence the distribution of teachers. Specifically, the regressions include the percentage of students who are minorities, English learners, eligible for free or reduced price lunch, expenditures per pupil, and average class size

In California, we found that a 1 percentage point increase in average adjusted teacher salaries is associated with a 3 percent decrease in the proportion of uncredentialed teachers, a 4 percent reduction in turnover (measured as the percentage of newly hired teachers in a given year), and a 2 percent reduction in the proportion of inexperienced teachers (those with less than three years of experience) (see Table 9). Similarly, in New York, a 1 percent increase in median adjusted teacher salaries is associated with a 3 percent decrease in the proportion of teachers without a permanent credential, a 2 percent reduction in the proportion of inexperienced teachers, and a 1.5 percent decrease in the proportion of teachers with lower levels of education (BA+30 or below).

As have other studies, we found that teacher qualifications are related to overall student achievement at the district level, both before and after controlling for student characteristics (see Tables 10 and 11). In California, district scores on the state Academic Performance Index (API) increase significantly as the proportion of teachers without a full credential decreases. In New York, the percentage of teachers without a permanent credential is significantly related to the proportion

of students failing the New York state tests (that is, scoring at a level 1) in English language arts and mathematics.

Table 9.
Relationships between Salaries and Teacher Qualifications

California	% of teachers with no valid certificate (SE)	% of teachers with <3 years of experience (SE)	Turnover (% newly hired teachers) (SE)
Average adjusted teacher salary (log)	-3.15** (1.12)	-2.30* (1.06)	-4.23** (1.38)
New York	% of teachers without a permanent credential (SE)	% of teachers with <3 years of experience (SE)	% of teachers with BA+30 or lower (SE)
Median teacher salary (log)	-2.77*** (0.32)	-1.85*** (0.53)	-1.51** (0.46)

Note: *** p<0.001, ** p<0.01, * p<0.05

Table 10.
Relationships between Teacher Qualifications and Student Achievement: California

Independent Variables	API scores	% of students proficient on the CST	
	California (SE)	California English (SE)	California math (SE)
% free or reduced lunch	-1.89*** (0.08)	-0.39*** (0.02)	-0.37*** (0.02)
% minority	-0.49*** (0.10)	-0.06** (0.02)	-0.03 (0.02)
% LEP	0.57*** (0.16)	-0.03 (0.03)	0.09** (0.03)
% Teachers w/less than full credential	-1.11*** (0.29)	-0.03 (0.05)	-0.05 (0.06)
% Teachers w/MA or higher	0.13 (0.10)	0.11*** (0.02)	0.08*** (0.02)
% Teachers w/fewer than 3 years exp.	-0.29 (0.19)	0.0 (0.04)	-0.01 (0.04)
Constant	886.36*** (5.40)	74.84*** (1.00)	72.79*** (1.19)
Observations	945	935	935
R-squared	0.57	0.66	0.47

Note: *** p<0.001, ** p<0.01, * p<0.05

In both states the proportion of teachers with master's degrees is significantly related to the proportion of students scoring proficient on the state tests. Unlike most other states, master's

degrees in both New York and California are typically associated with initial teacher preparation in field taught, because teacher-credentialing systems require post-baccalaureate training.[7] This distinguishes them from the rather undifferentiated courses of study used to pick up credits on the salary scale in most states, resulting in masters' degrees, which have generally been found unrelated to teacher effectiveness (Goldhaber & Brewer, 1998). Because these analyses are at the district level, however, rather than the individual teacher level, we interpret the master's degree variable as a general proxy for a generally better-qualified teaching force, rather than a dispositive finding regarding the value of master's degrees.

Table 11.
Relationships between Teacher Qualifications and Student Achievement: New York State

COEFFICIENT	% failing Level 1 ELA (SE)	% failing Level 1 math (SE)	% proficient Level 4 ELA (SE)	% proficient Level 4 math (SE)
% free/ reduced lunch	0.05***	0.04***	-0.55***	-0.54***
	(0.01)	(0.01)	(0.03)	(0.03)
% minority	0.05***	0.06***	-0.05	-0.07*
	(0.01)	(0.01)	(0.03)	(0.03)
% LEP	-0.12**	-0.18***	0.24	0.16
	(0.04)	(0.04)	(0.15)	(0.17)
% not permanently certified	0.17***	0.06*	0.25	0.16
	(0.05)	(0.03)	(0.18)	(0.20)
% masters or higher	0.0	-0.01	0.34**	0.29*
	(0.03)	(0.03)	(0.12)	(0.13)
% <3 years experience	-0.06	0.0	-0.23	0.19
	(0.04)	(0.04)	(0.16)	(0.18)
Constant	0.68	0.36	23.68*	29.55*
	(2.98)	(3.16)	(11.60)	(12.87)
Observations	678	678	678	678
R-squared	0.32	0.29	0.56	0.52

Note: *** $p<0.001$, ** $p<0.01$, * $p<0.05$

What can be Done to Distribute Well-Qualified Teachers More Equitably?

Many of the solutions offered for the inequitable distribution of teachers have been rendered less effective by large inequalities in school resources that translate into widely disparate teacher salaries and working conditions. For example, the idea of bonuses for those who would go to high-

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[7] In California, almost all teacher preparation occurs at the post-baccalaureate level. Many programs are nine-month credential programs that result in 30 credits beyond the bachelor's degree. Others are master's degree programs that offer more intensive training. In New York State, teachers must secure a master's degree in education to receive the full professional credential after their provisional period. Some complete a master's degree for their initial preparation while others continue their studies during their early years to receive a master's in the field in which they teach. In both states master's degrees are more likely to be directly related to teachers' teaching fields than the undifferentiated master's degrees that teachers may secure over the course of their careers (often degrees in counseling, administration, or other less instructionally related areas).

need schools might be productive if added to an equitable salary structure, but it may not adequately compensate for huge salary differentials and poor working conditions.

Most high-achieving nations do not experience these problems because they fund education equitably and offer competitive salaries to teachers, often pegged to those of other professionals, such as engineers (Darling-Hammond, 2010). These salaries are essentially equal across schools. Beyond an equitable base salary, some nations offer additional incentives for those who teach in high-need communities. These incentives range from additional credits for years of experience, housing supports, or a leg up on promotions, as well as monetary stipends.

We can also learn from some states that have employed successful strategies. Connecticut and North Carolina, for example, are examples of states serving large numbers of poor and minority students that pursued systemic strategies to equalize the distribution of teachers while upgrading teachers' knowledge and skills.[8] Beginning in the 1980s, these two states enacted some of the nation's most ambitious efforts to improve teaching. The National Education Goals Panel (NEGP) studied both states extensively when their efforts resulted in sharp increases in student performance during the 1990s. On the heels of their efforts, both registered striking gains in overall student learning and narrowed achievement gaps between advantaged and disadvantaged pupils.

Connecticut's steep gains throughout the decade resulted in fourth graders ranking first in the nation by 1998 in reading and math, despite increasing numbers of low-income, minority, and new immigrant students in its public schools during that time (NEGP, 1999). Connecticut was also the top performing state in writing and science, and the state's black and Hispanic students substantially outperformed their counterparts nationally (Baron, 1999).

North Carolina was the most successful state in narrowing the minority-white achievement gap during the 1990s. It posted the largest gains of any state in mathematics, and was the first southern state to score above the national average in fourth grade reading and math, although it had entered the decade near the bottom of the state rankings (NEGP, 1999).

Connecticut's Reforms

Connecticut's reforms followed a ruling from the state's high court that invalidated the state's school financing system, because it relied on local property taxes, which generated greatly unequal spending. A desegregation lawsuit filed in 1989 to challenge racially segregated schools tied to inequalities in funding prodded later reforms (Connecticut, 1996).

The National Educational Goals Panel cited the state's teacher policies as a critical element in explaining Connecticut's strong achievement gains, pointing to the 1986 Education Enhancement Act as the linchpin of these reforms (Baron, 1999). The bill coupled major increases in teacher salaries with higher standards for teacher education and licensing, and substantial investments in beginning teacher mentoring and professional development.

There were severe shortages of teachers in the state's cities at that time, and large numbers were hired without preparation. An initial investment of $300 million—the result of a state surplus—was used to boost minimum beginning teacher salaries in an equalizing fashion that made it possible for low-wealth districts to compete in the market for qualified teachers. As a state governed largely by the principles of local district control, Connecticut did not require districts to

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[8] In the fall of 1999, Connecticut had 30 percent students of color, including the 12th largest Hispanic enrollment in the nation, and in 2002, 36 percent of students attended Title I schools. In the same years, North Carolina had 38 percent students of color, including the 8th largest enrollment of African Americans, and 38 percent of students attended Title I schools (National Center for Education Statistics, 2002). In 2007, 34 percent of students in Connecticut were members of minority groups, as were 43 percent in North Carolina (National Center for Education Statistics, 2008).

meet the minimum salary level, but provided substantial salary aid to districts that used the funds to do so. Funds were allocated based on the number of fully certified teachers, creating incentives for districts to recruit those who had met the high new certification standards, and for individuals to meet these standards. With local bargaining, the new minimum created a floor that then raised veteran salaries as well. Between 1986 and 1991, the average teacher's salary increased by more than 50 percent in non-inflation adjusted dollars, from $29,437 in 1986 to $47,823 in 1991. The equalizing nature of the state aid made it possible for urban districts to compete for qualified teachers.

With these incentives, emergency credentials were eliminated. To ensure an adequate supply of teachers, the state offered additional incentives including scholarships and forgivable loans to attract high-ability candidates, especially in high-demand fields and for teachers of color. It also encouraged well-qualified teachers from other states to come to Connecticut by creating license reciprocity. These initiatives eliminated teacher shortages and created surpluses of teachers within three years (Connecticut State Department of Education, 1990). This allowed districts—including those in the cities—to be highly selective in their hiring and demanding in their expectations for teacher expertise. By 1990, nearly a third of newly hired teachers had graduated from colleges rated "very selective" in the Barron's Index of College Majors, and 75 percent had undergraduate grade point averages of "B" or better (Connecticut State Board of Education, 1992).

This alone would not have been enough to raise teaching quality, however. While increasing incentives to teach, the state raised teacher education and licensing standards by requiring a subject-matter major plus extensive knowledge of teaching and learning—including knowledge about literacy development and the teaching of special needs students. Candidates were required to pass tests of subject matter and teaching knowledge to receive a license, and to participate in a state-funded induction program, during which they received support from trained mentor teachers and completed a sophisticated performance assessment to determine who could continue in teaching after the initial two years.

North Carolina's Reforms

Omnibus legislation in 1983 launched North Carolina's reforms. Introduced toward the end of Governor James B. Hunt's first two-term stint in office, the reforms were part of his strong commitment to lift North Carolina up from the status of a low-spending, low-achieving state, like others in the Southeast at that time. The Elementary and Secondary School Reform Act enhanced school funding; upgraded standards for students, teachers, principals, and schools of education; upgraded expectations for local school staffing and personnel evaluation; and encouraged expanded professional development. This bill laid the groundwork for a series of initiatives throughout the 1980s, which were expanded further in the 1990s.

To make teaching a more attractive profession and to recruit individuals who could meet the new, higher standards, North Carolina boosted salaries in the mid-1980s and again in the 1990s, on an equalizing basis around the state teacher salary schedule. To ensure that good candidates could afford to enter teaching and would stay in the profession, the state launched the highly selective North Carolina Teaching Fellows program, which is still in operation today. The program selects hundreds of talented high school students each year and pays all of their college costs for an enhanced teacher education program in return for several years of teaching. The program brings a disproportionate number of males, minorities, and math and science teachers into the profession, and keeps them at rates of over 75 percent after seven years (National Commission on Teaching and America's Future, 1996).

North Carolina also required that all colleges of education create professional development school partnerships as the sites for yearlong student teaching placements and launched one of the

nation's first beginning teacher mentoring programs, which it has strengthened over the years. With changes to its a statewide minimum salary schedule, North Carolina was able to raise salaries to the national average while making them more equitable. And, it was the first state to add an increase of 12 percent to the base salary of all teachers who were able to achieve the distinction of National Board certification—a groundbreaking initiative to establish performance pay based on teachers' competence in the classroom. A recent North Carolina study found that student achievement gains were significantly greater for students whose teachers were National Board certified, as well as for those whose teachers had the strong academic and teaching preparation the state's policies have tried to leverage (Clotfelter, Ladd, & Vigdor, 2007).

The Need for Vigilance

Although Connecticut and North Carolina have retained many of the advantages of these efforts, tax caps and policy shifts since 2000 have eroded some of the equalizing aspects of their earlier funding reforms and reintroduced a double standard for hiring teachers in low-wealth districts. As a result, while the large majority of teachers are much better qualified—and non-poor students are much higher achieving—than they were two decades ago, achievement has not kept pace among poor and minority students who are, once again, more likely to be taught by less-experienced and less-qualified teachers under less-supportive teaching conditions than their more affluent peers.

This is not a new story. The continual backsliding of states and districts that have made striking but temporary progress when they undertake equalizing reforms points to the need for a stronger set of policy strategies, buttressed by both state and federal incentives.

Implications for Policy

Progress in equalizing resources to students will require attention to inequalities at all levels: between states, among districts, among schools within districts, and among students differentially placed in classrooms, courses, and tracks that offer substantially disparate opportunities to learn. How can policymakers tackle such a multifaceted agenda?

In the past, federal and state policymakers have offered aid to offset some of the inequalities that result from locally funded education tied to the wealth of communities, and have added a variety of categorical programs that give additional money for specific purposes to local districts, often with extensive strings attached. However, these strategies do not close the resource gap, and categorical grants have proliferated until the lowest-wealth districts must manage dozens or even hundreds of small pots of money that come and go. These funds are often inadequate to pay for their ostensible purposes, which fragments and defuses schools' efforts and attention and requires a panoply of administrative staff for management and reporting, rendering them unavailable for the core work of schools—getting and supporting good teachers and leaders to focus on student learning.

An alternative approach to ensure that resources are equitable and can be used for critical purposes is to allocate funding to districts based on equal dollars per student adjusted or weighted for specific student needs, such as poverty, limited English proficiency, and special education status. Establishing the per pupil base so that it represents what an adequate education to meet the standards actually costs, and determining the weights so that they accurately reflect the costs of meeting differential pupil needs is critically important for such a scheme to work well. This weighted student formula allocation should also be adjusted for cost-of-living differentials across large states, and should be supplemented with funds to address unavoidably variable costs such as

transportation, which is necessarily extensive in large, sparse rural districts, and school construction, which varies by ages of buildings and changing enrollment patterns.

   Developing such an equitable, reliable base of funding is important so that districts can maintain the foundational elements of quality education, and can make locally appropriate, strategic decisions about how to spend resources to achieve results. The reliability and availability of these funds to focus on the core work of education should reduce the wastefulness of the plethora of poorly integrated programs that are often created to address the shortcomings of a system that doesn't make adequate investments in strong teaching and personalized environments that would prevent students from falling through the cracks to begin with.

   State efforts to rationalize resource allocations should also aim to leverage strong outcomes for the dollars that are spent. As the Public Policy Institute of California observed,

   Equalization policies should do more than alter growth in overall budget levels. We believe they should target the area of greatest inequality: teacher preparation…. Traditional redistributive policies aimed at reducing variations in revenues per pupil across districts are unlikely to equalize student achievement across all schools…. (R)esource inequality is restricted primarily to teacher training and curriculum, so that redistribution must focus on these specific characteristics of schools rather than on revenues per pupil alone. (Betts, Rueben, and Danenberg, 2000, p. xxix-xxx)

Similarly, Ron Ferguson's findings about the importance of teacher expertise for student achievement led him to recommend that investments focus on districts' capacity to hire high-quality teachers. Ferguson's conclusion—that investments in more qualified teachers lead to greater achievement gains than other uses of educational dollars—led him to recommend that states direct funding to enable even higher salaries for qualified teachers in the neediest districts:

   Equal salaries will not attract equally qualified teachers to dissimilar school districts: for any given salary, teachers prefer school districts with higher socioeconomic status and judge the attractiveness of teaching in a given district against the allure of other opportunities. This suggests that a state policy of salary differentials ... will be necessary if each district is to get its proportionate share of the best teachers. (Ferguson, 1991, p. 489)

The PPIC study also argued that teacher shortages in the most heavily affected areas might be reduced through differential cost-of-education adjustments across school districts (Betts, Rueben, & Danenberg, 2000).

   This strategy is not unlike that used in some countries where teachers' salaries are designed to be equivalent across districts with added stipends for those who work in harder-to-staff schools. A weighted student formula approach with an adequate base of funding would provide districts serving the neediest students with the additional funds needed to support the differential salaries Ferguson and the PPIC report call for—rather than the lower salaries they typically offer today. A weighted formula, however, would not ensure that districts use the funds to hire more qualified staff or that a supply of such well-prepared staff would be available for them to recruit. This would require that the state enforce standards for teacher quality and create a strong, steady supply of effective practitioners – a job that goes beyond what districts themselves can do, even with a more stable and equitable distribution of local resources.

   Both the PPIC analysis and Ferguson's underscore the importance of a strategy like Connecticut's and North Carolina's that ended shortages and boosted student achievement by equalizing the distribution of better-qualified teachers. These successful reforms had three main aims. First, the states improved and equalized salaries to improve the pool of teachers and level the playing field across districts. They raised minimum salaries to a state recommended level, on a voluntary basis with state equalization aid in local control states such as Connecticut, and on a mandatory basis in states similar to North Carolina, which has a statewide salary schedule. An

effective strategy would adjust salaries for cost-of-living differentials, so that purchasing power is equalized. The states simultaneously raised teacher standards and teachers' knowledge and skills through strengthened preparation and licensing standards, strengthened evaluation for teachers and school leaders, and extensive professional development. These efforts create an infrastructure for professional excellence that allow its increased investments to be well spent and highly effective. Third, these states improved beginning teacher retention in order to improve effectiveness and lower the wasteful costs of high attrition by developing high-quality mentoring and a performance-based induction system. This is critical to creating a productive system that is also cost-effective, rather than pouring money into a system that would throw much of it away.

Although education is a state responsibility, federal policy could leverage strong steps toward ensuring that every child has access to adequate school resources and quality teachers. Just as federal funding to states is currently associated with requirements to evaluate and move toward more equitable outcomes for students, so federal investments should be tied to each state's movement toward equitable access to education resources. To address the inequities outlined here, the Congress could do several things:

First, congress could equalize allocations of ESEA resources across states so that high-poverty states receive a greater share than they currently do under a formula that favors wealthier states (Liu, 2006; Miller & Brown, 2010). Rather than pegging federal funds to the level of state funding for schools, allocation formulas could use indicators of student need, with adjustments for cost-of-living differentials that would create fewer disadvantages for poor states.

Second, the federal government could better enforce existing ESEA comparability provisions for ensuring equitable funding and equally qualified teachers to schools serving different populations of students. The law already requires that districts develop policies to balance the qualifications of teachers across schools serving more and less advantaged students, but this aspect of the law is weakly enforced, and wide disparities continue to occur. More recent legislative proposals, such as Representative Chaka Fattah's Student Bill of Rights (2011), call for equalized funding across schools, to enable access to qualified teachers and other resources.

Third, congress could require states to report on resource indicators to accompany their reports of academic progress for each school, reflecting the availability of well-qualified teachers; strong curriculum opportunities; books, materials and equipment (such as science labs and computers); and adequate facilities.

Finally, congress could evaluate progress on such resource measures in state plans and evaluations under the law, and require states to meet standards of resource equity – including the availability of well-qualified teachers – for schools identified as failing. As a condition for receiving federal funds, each state would need to include in its application for federal funds a report describing the state's demonstrated movement toward adequate and equitable access to education resources – and a plan for further progress.

Solving the inequitable distribution of well-qualified and effective teachers is not impossible, but it will ultimately require a focus on both strategic resource equalization and policies that leverage investments in the quality of personnel. With such investments, it may eventually become possible to construct the equitable access to quality teaching that all students deserve.

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