



SCHOOL FINANCE SERIES

How Money Matters for Schools

Bruce D. Baker

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Acknowledgments

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Table of Contents

Acknowledgments	iv
Preface	vi
Abstract	vii
Introduction	1
Linking Money to Real Resources	2
The Goals of State School Finance Formulas.....	3
What About the Arguments That “Money Doesn’t Matter”?	4
Studies of the Outcomes of School Finance Reforms	6
National Longitudinal Studies of School Finance Reforms.....	6
State-Level Studies of School Finance Reforms	7
The Costs of Common Outcomes	10
How Money Is Used Matters	11
Conclusions	14
Endnotes	16
About the Author	21

List of Tables and Figures

Figure 1: Conceptual Map of the Relationship of Schooling Resources to Children’s Measurable School Achievement Outcomes.....	2
Figure 2: Revenue of High-Poverty Districts in Massachusetts 1995–2015.....	8
Figure 3: Progressiveness of Funding in Massachusetts 1995–2015	9

Preface

Schools in the United States are among the most inequitably funded of any in the industrialized world, with those serving the most affluent students often much better resourced than those serving the poorest. These inequities in funding create dramatically different educational opportunities for children and contribute to differences in access to key educational resources—expert teachers, personalized attention, high-quality curriculum, good educational materials, and plentiful information resources—that support learning at home and at school.

In order to remedy these disparities and make the best use of public education resources, state and district leaders need to understand the costs, benefits, and effectiveness of strategies intended to address students' learning needs. Research on school resource adequacy and equity can help inform lawmakers about the wise and efficient use of resources to ensure that all schools are equipped to advance deeper learning and student well-being.

To assist policymakers as they seek to address these educational investment issues, the Learning Policy Institute (LPI) is publishing a series of reports, written by members of LPI's School Finance Researcher Network, on topics that aim to increase policymakers' access to research and data related to equitable school resources that are wisely used.

The first of these reports is Bruce Baker's *How money matters for schools*. The report reviews a substantial body of research to answer three questions: (1) Does money matter? (2) Do schooling resources that cost money matter? and (3) Do state school finance reforms matter? The answer to all three questions is yes.

After a thorough examination of the research, Baker summarizes: "An increasing body of rigorous empirical evidence suggests that substantive and sustained state school finance reforms matter for improving both the level and distribution of short-term and long-term student outcomes."

As Baker points out, a society that invests in its children reaps real and lasting economic and social benefits.

In the coming months, LPI will publish additional reports on topics such as finance equity and democracy, promising practices at the state and regional levels, the cost-effectiveness and broader social benefits of equitable and adequate funding, and how states and localities can address the out-of-school factors that influence student achievement through investments in community school models.

In combination, the series will provide a strong evidence-based tool kit for policymakers and legislators and a road map for understanding that resource equity is more than an aspiration: It can become a reality, with policies based on evidence and practices informed by the best research.

Linda Darling-Hammond
September 6, 2017

Abstract

For decades, some politicians and pundits have argued that “money does not make a difference” for school outcomes. While it is certainly possible to spend money poorly, this viewpoint is strongly contradicted by a large body of evidence from rigorous empirical research. A thorough review of research on the role of money in determining school quality leads to the following three conclusions: (1) on balance, in direct tests of the relationship between financial resources and student outcomes, money matters; (2) schooling resources that cost money are positively associated with student outcomes; and (3) sustained improvements to the level and distribution of funding across local public school districts lead to improvements in the level and distribution of student outcomes. While money alone is not the answer to all educational ills, more equitable and adequate allocation of financial inputs to schooling provides a necessary underlying condition for improving the equity and adequacy of outcomes. This document presents a brief explanation of the goal of school finance reforms, followed by summaries of the main bodies of evidence that illustrate how equitable and adequate school funding improves student outcomes. It closes with information about how certain kinds of specific investments can help to achieve these outcomes.

Introduction

For decades, some politicians and pundits have argued that “money does not make a difference” for school outcomes.¹ While it is certainly possible to spend money poorly, this viewpoint is strongly contradicted by a large body of evidence from rigorous empirical research. A thorough review of research on the role of money in determining school quality leads to the following conclusions:

Does money matter? Yes. On average, aggregate per-pupil spending is positively associated with improved student outcomes. The size of this effect is larger in some studies than in others, and, in some cases, additional funding appears to matter more for some students than for others—in particular students from low-income families who have access to fewer resources outside of school. Clearly, money must be spent wisely to yield benefits. But, on balance, in direct tests of the relationship between financial resources and student outcomes, money matters.

Do schooling resources that cost money matter? Yes. Schooling resources that cost money are positively associated with student outcomes. These include smaller class sizes, additional instructional supports, early childhood programs,² and more competitive teacher compensation (permitting schools and districts to recruit and retain a higher quality teacher workforce). Again, in some cases, these resources matter more for some students and in some contexts. On the whole, however, educational resources that cost money benefit students, and there is scarce evidence that one can gain stronger outcomes without these resources.

Do state school finance reforms that provide more equitable and adequate funding matter? Yes. Sustained improvements in the level and distribution of funding across local public school districts lead to improvements in the level and distribution of student outcomes. While money alone may not be the answer, more equitable and adequate allocation of financial inputs to schooling provides a necessary underlying condition for improving the equity and adequacy of outcomes. The available evidence suggests that appropriate combinations of more adequate funding with more accountability for its use may be most promising.³

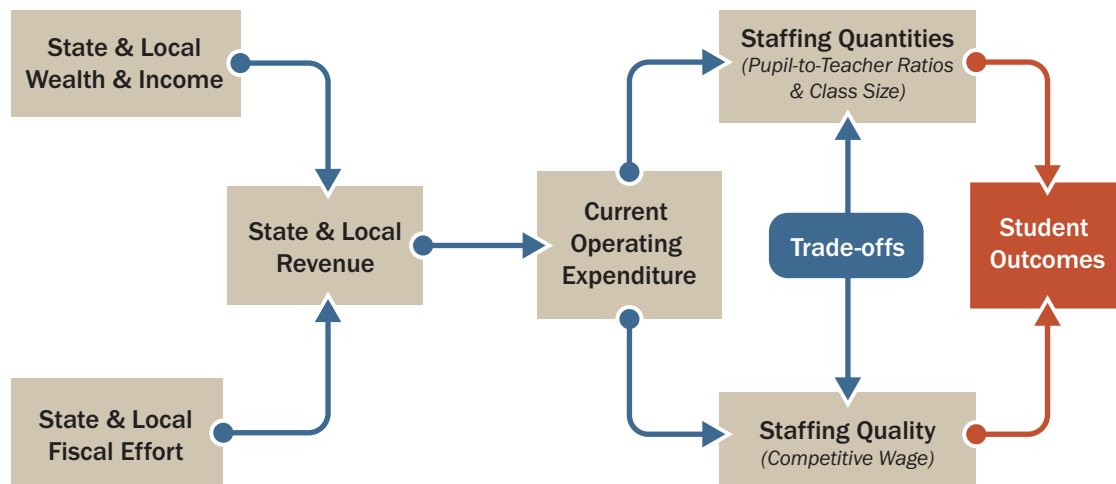
This document presents a brief explanation of the goal of school finance reforms, followed by summaries of the main bodies of evidence that illustrate how equitable and adequate school funding improves student outcomes. It closes with information about how certain types of specific investments matter—especially when it comes to achieving these outcomes. (For a longer and more complete version of this report, see *Does money matter in education?*⁴)

Linking Money to Real Resources

Figure 1 provides a simple model of the relationship of schooling resources to children’s school achievement. First, the fiscal capacity of states—their wealth and income—does affect their ability to finance public education systems. But the effort put forth in state and local tax policy plays an equal role.

The amount of state and local revenue raised drives the majority of current spending by local public school districts, because federal aid constitutes such a relatively small share—only about 9%, on average. Furthermore, the amount of money a district is able to spend on current operations determines the staffing ratios, class sizes, and wages a local public school district is able to pay. Indeed, there are trade-offs to be made between staffing ratios and wage levels: If all else is equal, the more teachers are hired, the less each can be paid. Finally, a sizable body of research has illustrated the connection between staffing qualities and quantities and student outcomes.

Figure 1
Conceptual Map of the Relationship of Schooling Resources to Children’s Measurable School Achievement Outcomes



The connections laid out in this model seem rather obvious. The amount a district raises dictates how much it can spend. How much you spend in a labor-intensive industry dictates how many individuals you can employ, the wage you can pay them, and in turn the quality of individuals you can recruit and retain.

The Goals of State School Finance Formulas

Modern state school finance formulas—aid distribution formulas—typically strive to achieve two simultaneous objectives:

1. Accounting for differences in the costs of achieving equal educational opportunity across schools and districts.
2. Accounting for differences in the ability of local public school districts to cover those costs.

In most cases, local district ability to raise revenues is a function of both local taxable property wealth and the incomes of local property owners, thus their ability to pay taxes on their properties. Without sufficient targeted investments from the state, then, school revenues vary by the wealth of those who live in different districts—with wealthier districts having more money to spend than poor ones. States try to offset these inequalities, although they succeed to varying degrees depending on how much money they put into the system and how they allocate it across functions (e.g., foundation aid, transportation costs, facilities) and different districts.

A typical state school finance formula implies that some basic funding level should be sufficient to produce a given level of student outcomes in an average school district. Logically, then, if one wishes to produce a higher level of outcomes, the foundation level should be increased. It costs more to achieve higher outcomes, and the foundation level in a state school finance formula is the tool used for determining the overall level of support to be provided.

As a rule of thumb, for a state school finance system to provide equal educational opportunity, that system must provide sufficiently higher resources to ensure adequacy and equity in higher need (e.g., higher poverty) settings than in lower need settings. Such a system is called *progressive*. By contrast, many state school finance systems barely achieve “flat” funding between high- and low-need settings, and still others remain regressive, spending more money on the education of more affluent students than on those who have greater needs.

To secure the same quality of education across districts, resource levels may need to be adjusted to permit districts in different parts of a state to recruit and retain teachers of comparable quality; that is, the wages paid to teachers affect who will be willing to work in any given school. In other words, teacher wages affect teacher quality, and in turn, they affect school quality and student outcomes. This is plain common sense, and this teacher wage effect operates at two levels.

1. In general, teacher wages must be sufficiently competitive with other career opportunities for similarly educated individuals. The overall competitiveness of teacher wages affects the overall academic quality of those who choose to enter teaching.
2. The relative wages for teachers across local public school districts determine the distribution of teaching quality. Districts with more favorable working conditions can pay a lower wage and attract the same teacher.

Finally, adjusting funding based on student need in state school finance formulas assumes that the additional resources can be leveraged to improve outcomes for students from low-income families or students with limited English language proficiency. First, note that some share of the additional resources is needed in higher poverty settings simply to provide for “real resource” equity—or to pay the wage premium for doing the more complicated job, under less desirable working conditions. Second, resource-intensive strategies such as reduced class sizes in the early grades, high-quality early childhood programs, intensive tutoring, and extended learning time programs may significantly improve outcomes of students from low-income families. And these strategies all come with significant additional costs.

What About the Arguments That “Money Doesn’t Matter”?

There has been a long-standing debate about whether increased resources actually improve student achievement. The debate began in the 1960s with the influential Coleman report (1966), which found a strong effect of student backgrounds on student achievement. Although the report did not conclude that resources don’t matter, it was widely interpreted as suggesting that resources have trivial effects on outcomes in comparison to student socioeconomic status.

After the release of the Coleman report, numerous scholars conducted studies to probe these findings further. In 1986, 20 years after Coleman, economist Eric Hanushek published a paper looking at these studies, which became one of the most widely cited sources for the claim that money doesn’t matter.⁵ Hanushek tallied the findings of those studies. Some found a positive relationship between spending and student outcomes, while others did not. He came to the following conclusion: “There appears to be no strong or systematic relationship between school expenditures and student performance.”⁶

This finding echoed for many years through the halls of state and federal courthouses, where school funding is deliberated. However, many of the studies originally reviewed by Hanushek, published in the 1960s and 1970s, had serious methodological flaws and would no longer pass muster, given advances in data quality and statistical techniques.

The most direct rebuttal to Hanushek’s conclusion came in a series of re-analyses by University of Chicago scholars Rob Greenwald, Larry Hedges, and Richard Laine,⁷ who gathered the studies originally cited by Hanushek in 1986 and conducted meta-analyses of those from the U.S. that met research quality parameters such as peer review and use of proper statistical controls. They found that, among statistically significant findings, the vast majority of study findings were positive (11:1) as were most of the non-significant findings. They concluded:

“Global resource variables such as PPE [per-pupil expenditures] show strong and consistent relations with achievement. In addition, resource variables that attempt to describe the quality of teachers (teacher ability, teacher education, and teacher experience) show very strong relations with student achievement.”

Digging deeper and exploring the relationship between a variety of resource and student outcome measures, Greenwald, Hedges and Laine came to the conclusion that “a broad range of resources were positively related to student outcomes, with ‘effect sizes’ large enough to suggest that moderate increases in spending may be associated with significant increases in achievement.”⁸

Other researchers looked with greater precision at the measures of financial inputs to schooling that are most strongly associated with variations in student outcomes. For example, Harold Wenglinsky found that “per-pupil expenditures for instruction and the administration of school districts are associated with achievement because both result in reduced class size, which raises achievement.”⁹ Ron Ferguson found that investments in teacher quality were particularly effective in raising achievement.¹⁰

Recent studies have invariably found a positive, statistically significant relationship between student achievement gains and financial inputs.

More recent studies have added improvements, such as adjusting for regional cost differences¹¹ and making other statistical corrections to measure inputs more precisely.¹² These studies have invariably found a positive, statistically significant relationship between student achievement gains and financial inputs.¹³

To summarize this discussion of whether resources matter, it is important to recognize that Hanushek’s original conclusion from 1986 was merely a statement of “uncertainty” about whether a *consistent* relationship exists between spending and student outcomes—one that is big enough to be important. His conclusion, based on many studies with methodological flaws, was that the relationship was inconsistent. By the early 2000s, the cloud of uncertainty had largely lifted with the more rigorous studies that followed, conducted by many finance scholars using detailed datasets to examine more finely grained relationships between money and student outcomes. We review some of these studies showing how money matters.

Summing It Up

Since the Coleman report, some have said that “money doesn’t matter” because of the strong effect of student backgrounds on student achievement, plus early studies with inconsistent results. However, this position is no longer well grounded because:

- Older studies were methodologically limited.
- New data analyses using advances in data quality and statistical techniques consistently show that money makes a difference.
 - National studies in the early 2000s conducted by finance scholars using detailed datasets found positive relationships between school funding reforms that increased spending on students from low-income families and student outcomes.
 - Similar findings pertain to reforms in Kansas, Massachusetts, Michigan, and Vermont (see pp. 6–10 for more details).
 - Often, moderate increases in spending are associated with significant increases in achievement and graduation rates.
 - Investments in teacher quality (teacher ability, teacher education, and teacher experience) are particularly effective in raising achievement.

Studies of the Outcomes of School Finance Reforms

Investments in more adequate and equitable approaches to school funding have been delayed for some time by both revenue challenges and the widely held view that “money doesn’t matter” when it comes to educational outcomes. The question to be answered, however, is an empirical one: What happens when states adjust their school funding systems to take pupils’ needs into greater account? We now have two kinds of studies that answer this question: large-scale, cross-state studies that look at the effects of reforms nationwide, and state-specific studies that look at changes in outcomes over time as a function of school funding reforms. Both show positive outcomes for students of more progressive school funding changes.

National Longitudinal Studies of School Finance Reforms

An increasing body of rigorous evidence, including multistate analyses over time, suggests that **substantive and sustained state school finance reforms are important for improving both the level and distribution of short-term and long-term student outcomes.** One such study found “evidence that equalization of spending levels leads to a narrowing of test score outcomes across family background groups.”¹⁴

Access to increased longitudinal data on both local district level school finances and student outcomes has enabled a new wave of research on the topic.¹⁵ One such analysis evaluated the long-term effects on high school graduation rates and eventual adult income of substantial infusions of funding to local public school districts through school finance reforms of the 1970s and 1980s.¹⁶ This study linked the presence of reforms to changes in the distribution of dollars and other resources across schools and children, and the outcome effects of those changes. The researchers found that “the estimated effect of a 21.7% increase in per-pupil spending throughout all 12 school-age years for children from low-income families is large enough to eliminate the education attainment gap between children from low-income and non-poor families.” This size investment led to a 20-percentage-point increase in graduation rates and, on average, an additional year of educational attainment for these children.

Even lower levels of investment made a sizable difference. The researchers found that “increasing per-pupil spending by 10% in all 12 school-age years increases the probability of high school graduation by 7 percentage points for all students, by roughly 10 percentage points for low-income children, and by 2.5 percentage points for non-poor children.” They also observed positive effects on adult wages, with a 9.6% increase in adult hourly wages, and a substantial decrease in adult poverty rates resulting from this size investment.¹⁷

“A 21.7% increase in per-pupil spending throughout all 12 school-age years for children from low-income families is large enough to eliminate the education attainment gap between children from low-income and non-poor families.”

A recent study evaluated the influence of adequacy-oriented school funding reforms during the 1990s and 2000s.¹⁸ Using data from the National Assessment of Educational Progress, the researchers found that “reforms cause gradual increases in the relative achievement of students

in low-income school districts, consistent with the goal of improving educational opportunity for these students. The implied effect of school resources on educational achievement is large.”¹⁹

Another national longitudinal analysis found that states with greater overall investment in education resulting in more intensive staffing per pupil tend to have higher outcomes for children from low-income families, higher performance in schools serving children from low-income families, and smaller disparities between schools serving children from low-income families and schools serving more advantaged populations.²⁰

And most recently, a study found that there is a strong relationship between state school finance reforms and graduation rates. Seven years after the reforms, the poorest districts showed an average 12% increase in per-pupil spending and increases in graduation rates of between 6 and 12 percentage points.²¹

Collectively, these studies provide compelling new evidence of the large-scale achievement and economic benefits of substantive and sustained additional funding for schools serving higher-poverty student populations.

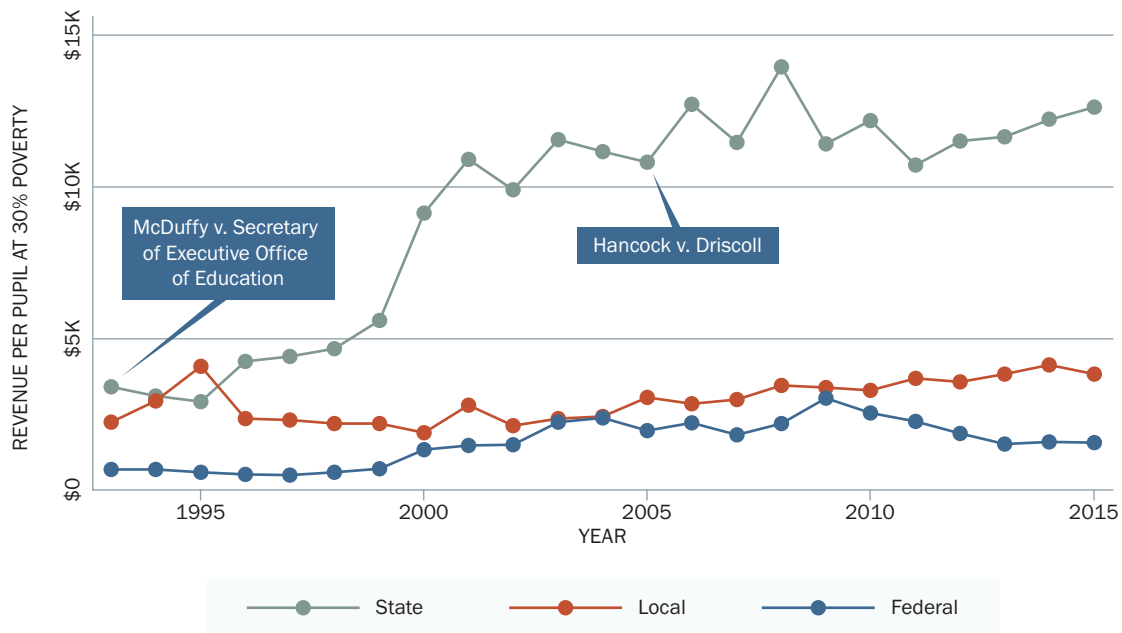
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State-Level Studies of School Finance Reforms

Over the years, several state-specific studies of school finance reforms have validated the positive influence of those reforms on a variety of student outcomes. Massachusetts and Michigan reforms of the 1990s are among the most studied. Both states implemented significant reforms to their school finance systems in the early to mid-1990s, and maintained them for a decade or more, although Massachusetts reforms have waned over the past decade and Michigan reforms have largely collapsed.²² Even the most vocal critics of school finance reform concede that Massachusetts in particular may have struck the right balance between funding and accountability reforms.²³ These reforms set standards for student learning and teacher preparation, while creating expectations and systems to support improvement in response to data about student outcomes.

In 1993, following the *McDuffy v. Secretary of Education* lawsuit,²⁴ Massachusetts adopted a package of far-reaching education reforms that included a new education funding formula under Chapter 70 of the state code.²⁵ Chapter 70 established a “foundation budget” for all districts, which calculates expenditures for each district in each of 11 functional categories (e.g., administration, teachers, pupil services, professional development, etc.), adjusted for wage costs and for the higher costs of students in poverty, English learners, and those identified for special education. It then calculated how much each district could afford to contribute (based on local revenues) and created a fund of state aid to fill gaps when local revenue proved inadequate to meet the foundation level.²⁶

Figure 2
Revenue of High-Poverty Districts in Massachusetts 1995–2015

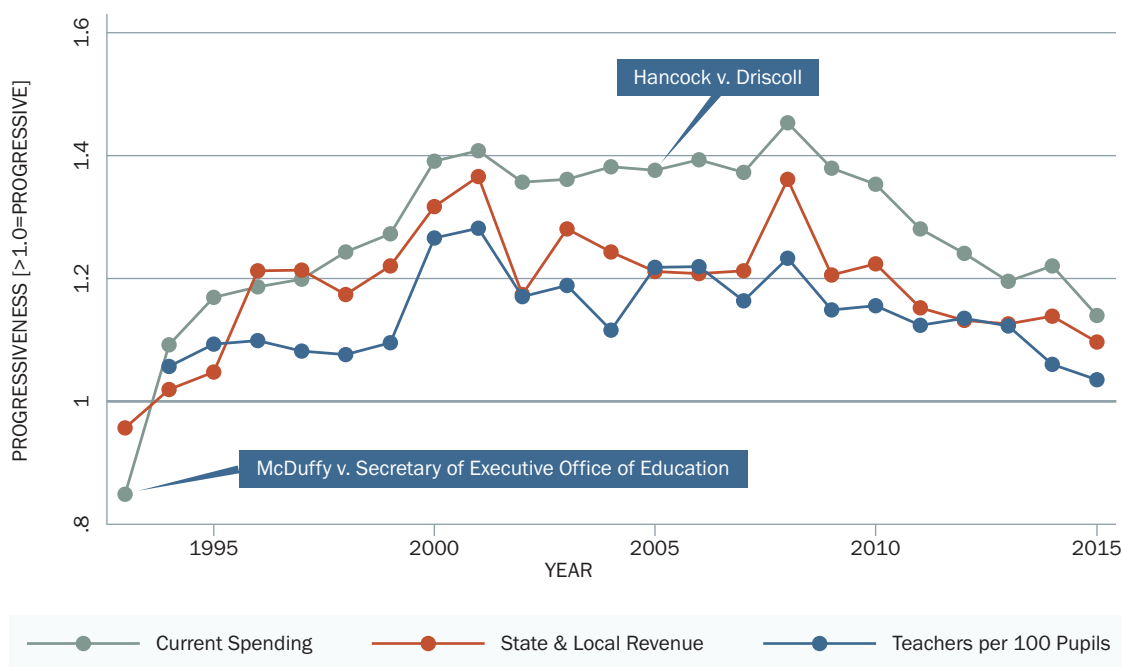


Source: Baker, B. D., Srikanth, A., & Weber, M. A. (2016). Rutgers Graduate School of Education/Education Law Center: School Funding Fairness Data System. <http://www.schoolfundingfairness.org/data-download>.

Figure 2 shows the changes in revenue by source for high-poverty school districts in Massachusetts since then. State aid per pupil scaled up dramatically from 1995 through 2000 and then climbed more slowly through 2015. During this period, in *McDuffy’s* successor case *Hancock v. Driscoll* (2005), Massachusetts’ Supreme Judicial Court held that while serious inadequacies in public education remained, the state was working to systemically address those deficiencies and the funding system did not violate Massachusetts’ constitutional duty as outlined in *McDuffy*.²⁷

Figure 3 shows that these reforms had significant influence on the level and progressiveness of funding and staffing for Massachusetts school districts. That is, over the period when state aid to high-poverty schools was increased significantly, high-poverty districts received 40% more state and local revenue per pupil than low-poverty districts. This raised current spending and staffing ratios. Although the state still spends more on high-poverty than low-poverty districts, the degree of progressiveness has waned since 2008, as state aid has remained flat for high-poverty districts and local spending has increased for low-poverty districts.

Figure 3
Progressiveness of Funding in Massachusetts 1995–2015



Source: Baker, B. D., Srikanth, A., & Weber, M. A. (2016). Rutgers Graduate School of Education/Education Law Center: School Funding Fairness Data System. <http://www.schoolfundingfairness.org/data-download>.

Three studies of Massachusetts school finance reforms from the 1990s found positive effects on student performance. The earliest study found that the combination of funding and accountability reforms “has been successful in raising the achievement of students in the previously low-spending districts.”²⁸ The second found that increases in per-pupil spending led to significant increases in mathematics, reading, science, and social studies test scores for 4th- and 8th-grade students overall.²⁹ The most recent of the three found that “changes in the state education aid following the education reform resulted in significantly higher student performance.”³⁰

Such findings have been replicated in other states, including Vermont, where studies of Act 60 school finance reforms in the late 1990s concluded the initiative “dramatically reduced dispersion in education spending ... by weakening the link between spending and property wealth.” The research also found that “student performance has become more equal in the post-Act 60 period.”³¹

Many other researchers have explored the effects of specific state school finance reforms over time. In the early 1990s, Michigan eliminated the property tax as a source of school tax revenue and replaced it with state funds generated through the sales tax and a new tax earmarked to schools.³² Proposal A dramatically improved funding equity among school districts by creating a minimum per-pupil foundation allowance and by accelerating funding for the low-revenue school districts more quickly than the other school districts, reducing inequality in spending among rich and poor districts. Between 1993 and 2003, both revenues and expenditures increased by 60%, while funds were more equitably distributed.

Studies of Michigan’s school finance reforms have shown positive effects on student performance. One of these studies found that “Proposal A was quite successful in reducing interdistrict spending disparities. There was also a significant positive effect on student performance in the lowest spending districts as measured in state tests.”³³ Another study found significant positive effects on achievement in the previously lower performing districts.³⁴

A growing body of research demonstrates that state school finance reforms can have large, positive effects on student outcomes, raising educational attainment and reducing gaps.

Similarly, a study of the effects of 1992 school finance reforms in Kansas, which also involved primarily a leveling up of low-spending districts,³⁵ found that a 20% increase in spending was associated with a 5% increase in the likelihood of students going on to postsecondary education.³⁶

To summarize, a growing body of research demonstrates that state school finance reforms can have large, positive effects on student outcomes, raising educational attainment and reducing gaps.

The Costs of Common Outcomes

A related body of studies has sought to determine the predicted cost of achieving state-mandated outcome targets, and the weights or adjustments needed for children with different backgrounds to have equal opportunity to achieve those goals. These studies find that:

- It costs more to achieve higher outcome goals—such as higher graduation rates or test scores for all children—than lower outcome goals, all else being equal.³⁷
- Student characteristics make a difference for costs. In particular, as concentrated poverty increases, the costs of achieving any given level of outcomes increase significantly.³⁸
- District features, especially size, also matter. The per-pupil costs of achieving a given level of outcomes are sensitive to district structural characteristics, most notably, economies of scale.³⁹

As common sense would suggest, it takes more money to get a more ambitious job done, and it takes more when students have greater needs. In fact, in a school district in which 100% of the children come from low-income households, the costs of achieving common outcome goals may be double (or more) than those of a district with no children from low-income households.

How Money Is Used Matters

That money matters for improving school quality is grounded in the premise that having more money provides schools and districts the opportunity to improve the qualities and quantities of school- and classroom-level resources.

The primary resources involved in the production of schooling outcomes are human resources: quantities and qualities of teachers, administrators, support, and other staff in schools. Quantities of school staff are reflected in pupil-to-teacher ratios and average class sizes. Reduction of class sizes or reductions of total teaching or specialist caseloads requires additional staff, thus additional money, assuming the wages and benefits for additional staff remain constant. Qualities of school staff depend in part on the compensation available to recruit and retain the staff—specifically salaries and benefits, in addition to working conditions. Notably, working conditions may be reflected in part through measures of workload, such as average class sizes, as well as the composition of the student population.

A 2015 study explored how specific schooling resources responded to shifts in funding. The researchers found that spending increases were associated with noticeable improvements in wages, smaller pupil-teacher ratios, and longer school years.⁴⁰ These investments in schooling resources that occurred as a result of school finance reforms were likely responsible for the resultant gains in student outcomes. Such findings are consistent with studies validating the link between spending and staffing quantities.⁴¹

Increased funding tends to lead to reduced class size as districts hire more teachers.⁴² A significant body of research points to the effectiveness of class-size reduction for improving student outcomes and reducing gaps among students, especially for younger students and those who have been previously low-achieving.⁴³ These reductions for young children have long-term effects on outcomes many years into the future.⁴⁴ Often studies find that the effects of class size reduction on achievement are greatest when certain smaller class thresholds (such as 15 or 18) are reached, and are most pronounced for students of color and those in schools serving concentrations of students in poverty.⁴⁵

A 2013 study provides the most direct cost-effectiveness comparison of class size reduction policies with other options for which sufficient data on costs and outcome benefits were available, finding that “if focused on students in the poorest third of schools, then the cost-effectiveness of class size reduction is within the range of other interventions.”⁴⁶

A recent comprehensive meta-analysis of programs and strategies for improving outcomes for children from low-income households finds interventions that intensify human resources to be particularly effective when compared with alternatives.⁴⁷ Examining 101 studies from the past 15 years, the researchers found the largest effects on achievement were from interventions like tutoring, small-group instruction, and coaching or mentoring of children’s teachers.

The major alternative to buying more staff is to invest more in each staff member—that is, to improve wage competitiveness in order to recruit and retain higher quality teachers and other school staff. Spending to achieve competitive wages also matters. A substantial body of literature validates the conclusion that teachers’ overall wages and relative wages affect the quality of those who choose to enter the teaching profession—and whether they stay once they get in. For example,

one study found that salaries affect the decision to enter teaching and the duration of the teaching career in Michigan,⁴⁸ while others concluded that higher salaries are associated with more qualified teachers across states.⁴⁹

And increases in teacher wages have been found in several studies to be associated with increased student achievement—presumably because more capable teachers can be recruited and retained.⁵⁰ A study that adjusted for labor market differentials showed that:

Once we adjust for labor market factors, we estimate that raising teacher wages by 10 percent reduces high school dropout rates by 3 percent to 4 percent. Our findings suggest that previous studies have failed to produce robust estimates because they lack adequate controls for non-wage aspects of teaching and market differences in alternative occupational opportunities.⁵¹

Salaries also play a potentially important role in improving the *equity* of student outcomes. Although several studies have shown that higher salaries relative to labor market norms can draw higher quality candidates into teaching, the evidence also indicates that relative teacher salaries across schools and districts may influence the distribution of teaching quality. For example, a New York study found that:

(T)eachers in districts with higher salaries relative to non-teaching salaries in the same county are less likely to leave teaching and that a teacher is less likely to change districts when he or she teaches in a district near the top of the teacher salary distribution in that county.⁵²

In short, although salaries are not the only factor involved, they do affect the quality of the teaching workforce, which in turn affects student outcomes. A permanent upward shift in the competitiveness of teacher wages may substantively improve the quality of the teacher workforce and, ultimately, student outcomes.

At the same time, research evaluating spending constraints or reductions has revealed the potential harm to teaching quality that flows from leveling down or reducing spending. For example, a 2001 study noted that “using data from the National Center for Education Statistics, we find that tax limits systematically reduce the average quality of education majors, as well as new public school teachers in states that have passed these limits.”⁵³ The researchers also found that tax limitations are associated with “larger student-teacher ratios and lower cost-of-living adjusted starting teacher salaries, all else equal” and with “lower student performance on mathematics, science, social studies and reading examinations, all else equal.”⁵⁴

California serves as a particularly dramatic case study of the long-run detrimental effects of strict tax and expenditure limits, following the tax cap imposed by Proposition 13 in 1979. A series of studies illustrate the negative fallout of Proposition 13 for the state’s public schools. After 20 years of declining investments, analyses by the RAND Corporation and the Public Policy Institute of California confirmed that, by 2000, California students performed considerably

Increases in teacher wages have been found in several studies to be associated with increased student achievement—presumably because more capable teachers can be recruited and retained.

worse than those in other states, even after adjusting for language backgrounds, ethnicity, and parental education.⁵⁵ The RAND Corporation report found that the growing number of underqualified teachers contributed to growing inequality in opportunities to learn. And according to an analysis by Policy Analysis for California Education (PACE), the decline in funding and the growing inequality in access to qualified teachers caused the relationship between socioeconomic measures and achievement scores to grow stronger.⁵⁶

Because of school funding inequities, many local public school districts across the nation must serve high-need student populations with comparable or fewer financial resources than nearby districts serving less-needy student populations.⁵⁷ This can affect both teacher quality and class sizes negatively. Research has shown that school funding disparities in California and New York were associated with disparities in teacher compensation and class sizes—the less funding, the less competitive the compensation and the larger the classes.⁵⁸ Further, disparities in teacher compensation were associated with disparities in teacher qualifications, with children from low-income families and children of color often served by teachers with less training, education, and experience.

Similarly, a national analysis identified several large states—including California, Illinois, Louisiana, New York, Ohio, Pennsylvania, and Virginia—in which “district spending is positively associated with competitive salary differentials, average teacher salaries, and numbers of certificated staff per 100 pupils.”⁵⁹ Further, “in each of these states, district poverty rates are negatively associated with competitive salary differentials, average teacher salaries and numbers of certified staff per 100 pupils.” Where high-need districts and schools have both larger classes and less competitive wages than their neighbors, trading off one for the other simply isn’t an option. Both large classes and lower quality teachers undermine educational quality for students.

To summarize:

- Reasonable class sizes matter for student achievement, especially in the early years and for students who have more educational needs or attend high-poverty schools.
- The relative salaries of teachers, with respect to other labor market opportunities in non-teaching fields, can substantively affect the quality of entrants to the teaching profession, applicants to preparation programs, and student outcomes.
- Diminishing resources for schools can constrain both the number of teachers and teacher salaries, thus reducing the quality of the labor supply.
- Salary differentials across schools and districts—typically associated with unequal school funding systems—affect how teachers sort across schools within the profession.
- And, not surprisingly, how much money is available affects the competitiveness of salaries and the reasonableness of student-teacher ratios.⁶⁰

Conclusions

The preponderance of evidence shows that resources do matter—and that state school finance reforms that create more adequate and equitable funding can improve student outcomes, especially for students from low-income families.

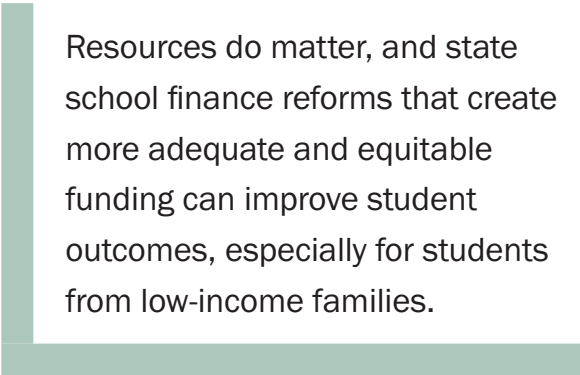
First, improvements in the adequacy and equity of per-pupil spending are positively associated with improved student outcomes. In some studies, the size of this effect is larger than in others, and, in some cases, additional funding appears to matter more for some students than for others—typically for students with the greatest educational needs. Clearly, there are other factors that moderate the influence of funding on student outcomes, such as how that money is spent. But the association of higher spending with better student outcomes holds true, on average, even in large-scale studies across multiple contexts. On balance, in direct tests of the relationship between financial resources and student outcomes, money matters.

Second, schooling resources that cost money, including class-size reductions and increased teacher compensation, are positively associated with student outcomes, especially when they are used strategically—for example, when resources are used to create optimal class sizes for young children and those with greater needs, and when investments in salaries are used to improve teacher quality.

Third, sustained improvements to the level and distribution of funding across local public school districts have been shown to lead to improvements in the level and distribution of student outcomes, ranging from graduation rates to educational attainment and wages. While money alone may not be the answer, adequate and equitable distributions of financial inputs to schooling provide a necessary underlying condition for improving the adequacy and equity of outcomes. If the money is there, schools can use it productively; if it is not, they cannot. But proper use of funds is also important. Evidence from Massachusetts, in particular, suggests that appropriate combinations of more funding with accountability grounded in thoughtful standards for students and teachers may be most promising.

Given the preponderance of evidence that resources do matter and that state school finance reforms can effect changes in student outcomes, it seems surprising that doubt has persisted. In many cases, direct assertions are made that schools can do more with less money; that money is not a necessary underlying condition for school improvement; and, in the most extreme cases, that cuts to funding might actually stimulate improvements that past funding increases have failed to accomplish.

There is no evidence for these claims. On the contrary, there is evidence that money does matter. Schools and districts with more money clearly have a greater ability to provide higher quality, broader, and deeper educational opportunities to the children they serve. Furthermore, in the absence of adequate funding, or in the aftermath of deep cuts to existing funding, schools are unable to do many of the things necessary to develop or maintain the key elements of quality education, and achievement ultimately declines.



Resources do matter, and state school finance reforms that create more adequate and equitable funding can improve student outcomes, especially for students from low-income families.

Without adequate funding, efficiency trade-offs (like focusing on teacher quality versus teacher quantity) and innovations (like blended learning) that are broadly endorsed are impossible to consider. One cannot trade spending money on class-size reductions for an increase in teacher salaries to improve teacher quality if funding is not there for either—if class sizes are already large and teacher salaries noncompetitive. And when these conditions occur where student needs are greatest, the ability to provide the resources necessary to close learning gaps is missing.

The available evidence leaves little doubt: Sufficient financial resources, equitably distributed in relation to pupil needs, are a necessary underlying condition for providing quality education.

Endnotes

1. See for example, Hanushek, E. (2003). *The structure of analysis and argument in plaintiff expert reports for Williams v. State of California*, p. 4. http://www.decentsschools.org/expert_reports/hanushek_report.pdf.
2. For a comprehensive review of research on the effectiveness of early childhood education programs, see Barnett, W. S. (2011). Effectiveness of early educational intervention. *Science* 333(6045), 975–978.
3. Baker, B. D. (2016). *Does money matter in education?* Washington, DC: Albert Shanker Institute.
4. Baker, B. D. (2016). *Does money matter in education?* Washington, DC: Albert Shanker Institute.
5. A later article by Hanushek, reiterating and updating his earlier findings, also shows up as widely cited in the Social Science Citation Index: Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: An update. *Educational Evaluation and Policy Analysis* 19(2): 141–164.
6. Hanushek, E. A. (1986). “Economics of schooling: Production and efficiency in public schools,” *Journal of Economic Literature* 24(3): 1141–1177. A few years later, Hanushek paraphrased this conclusion as “Variations in school expenditures are not systematically related to variations in student performance” in Hanushek, E. A. (1989). “The impact of differential expenditures on school performance,” *Educational Researcher* 18(4): 45–62.
7. R. Greenwald, L. Hedges and R. Laine, “The Effect of School Resources on Student Achievement,” *Review of Educational Research* 66, no. 3 (1996): 361–396.
8. R. Greenwald, L. Hedges and R. Laine, “The Effect of School Resources on Student Achievement,” *Review of Educational Research* 66, no. 3 (1996): 361–396.
9. H. Wenglinsky, “How Money Matters: The Effect of School District Spending on Academic Achievement,” *Sociology of Education* 70, no. 3 (1997): 221–237, at p. 221.
10. Ferguson, R. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal on Legislation*, 28, 465–498.
11. C. Taylor. “Does Money Matter? An Empirical Study Introducing Resource Costs and Student Needs into Educational Production Function Analysis,” in *Developments in School Finance, 1997*, ed. W. J. Fowler Jr. (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 1998), <http://nces.ed.gov/pubs98/98212.pdf#page=83>.
12. B. D. Baker, “Can Flexible Non-Linear Modeling Tell Us Anything New About Educational Productivity?” *Economics of Education Review* 20, no. 1 (2001): 81–92; D. N. Figlio, “Functional Form and the Estimated Effects of School Resources,” *Economics of Education Review* 18, no. 2 (1999): 242–252; and J. Dewey, T. Husted and L. Kenny, “The Ineffectiveness of School Inputs: A Product of Misspecification,” *Economics of Education Review* 19, no. 1 (2000): 27–45.
13. For a more complete review of these studies, see Baker, B. D. (2017, October 20). School funding myths & misdirects [Blog post]. Retrieved from <https://schoolfinance101.wordpress.com/2017/10/20/school-funding-myths-misdirects/>.
14. Card, D., & Payne, A. A. (2002). School Finance Reform, the Distribution of School Spending, and the Distribution of Student Test Scores. *Journal of Public Economics*, 83(1), 49–82, at p. 49.
15. One publicly available longitudinal data set can be found at: Baker, B. D., Srikanth, A., & Weber, M. A. (2016). *Rutgers Graduate School of Education/Education Law Center: School Funding Fairness Data System*. <http://www.schoolfundingfairness.org/data-download>.
16. Jackson, C. K., Johnson, R. C., & Persico, C. (2015). *The effects of school spending on educational and economic outcomes: Evidence from school finance reforms* (NBER working paper #20847). Cambridge, MA: National Bureau of Economic Research.
17. Jackson, C. K., Johnson, R. C., & Persico, C. (2015). *The effects of school spending on educational and economic outcomes: Evidence from school finance reforms* (NBER working paper #20847). Cambridge, MA: National Bureau of Economic Research.

18. Lafortune, J., Rothstein, J., & Schanzenbach, D. W. (2015). *School finance reform and the distribution of student achievement*. (Working paper). University of California at Berkeley. http://eml.berkeley.edu/~jrothst/workingpapers/LRS_schoolfinance_120215.pdf.
19. Lafortune, J., Rothstein, J., & Schanzenbach, D. W. (2015). *School finance reform and the distribution of student achievement*. (Working paper). University of California at Berkeley. http://eml.berkeley.edu/~jrothst/workingpapers/LRS_schoolfinance_120215.pdf.
20. Baker, B. D., & Weber, M. (2016). Beyond the echo chamber: State investments and student outcomes in U.S. elementary and secondary education. *Journal of Education Finance*, 42(1), 1–27; See also: Baker, B. D., Farrie, D., & Sciarra, D. G. (2016). Mind the gap: 20 years of progress and retrenchment in school funding and achievement gaps. *ETS Research Report Series*, 2016(1), 1–37.
21. Candelaria, C., & Shores, K. (2017). *Court-ordered finance reforms in the adequacy era: Heterogeneous causal effects and sensitivity*. Stanford, CA: Center for Educational Policy Analysis.
22. Baker, B. D. (2016). School finance & the distribution of equal educational opportunity in the post-recession U.S. *Journal of Social Issues*, 72(4), 629–655; See also Baker, B. D. (2016). *Review of “School spending and student achievement in Michigan: What’s the relationship?”* Boulder, CO: National Education Policy Center.
23. Hanushek, E. A., & Lindseth, A. A. (2009). *Schoolhouses, Courthouses, and Statehouses: Solving the Funding-Achievement Puzzle in America’s Public Schools*. Princeton, NJ: Princeton University Press.
24. *McDuffy v. Secretary of the Executive Office of Education*, 415 Mass. 545 (1993).
25. Defining Adequate School Funding Level In Massachusetts. (2017). <http://www.doe.mass.edu/finance/chapter70/chapter-cal.pdf>.
26. Massachusetts Budget and Policy Center. (2010). *Demystifying the chapter 70 formula: How the Massachusetts education funding system works*. Boston, MA: Author. http://www.massbudget.org/report_window.php?loc=Facts_10_22_10.html.
27. *Hancock v. Driscoll*, 443 Mass. 428 (2005).
28. Downes, T. A., Zabel, J., & Ansel, D. (2009). *Incomplete grade: Massachusetts education reform at 15*. Boston, MA: MassINC, 5.
29. The magnitudes imply that a \$1,000 increase in per-pupil spending leads to approximately a one third to one half of a standard deviation increase in average test scores. It is noted that the state aid driving the estimates is targeted to underfunded school districts, which may have atypical returns to additional expenditures. Guryan, J. (2001). *Does money matter? Regression-discontinuity estimates from education finance reform in Massachusetts* (Working Paper No. 8269). Cambridge, MA: National Bureau of Economic Research.
30. Nguyen-Hoang, P., & Yinger, J. (2014). Education finance reform, local behavior, and student performance in Massachusetts. *Journal of Education Finance*, 39, 297–322, at p. 297.
31. Downes, T. A. (2004). “School finance reform and school quality: Lessons from Vermont” in Yinger, J. (Ed.), *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*, 283–313, at p. 312. Cambridge, MA: MIT Press.
32. Lockwood, A. *School finance reform in Michigan: Proposal A—A retrospective*. Lansing, MI: Office of Revenue and Tax Analysis, Michigan Department of Treasury. https://www.michigan.gov/documents/propa_3172_7.pdf.
33. Roy, J. (2011). Impact of school finance reform on resource equalization and academic performance: Evidence from Michigan. *Education Finance and Policy*, 6(2), 137–167, at p. 137.
34. Papke, L. (2005). The effects of spending on test pass rates: Evidence from Michigan. *Journal of Public Economics*, 89(5–6), 821–839.
35. Llopis-Jepsen, C. (2014, January 19). School finance shaped by history of lawsuits. *The Topeka Capital-Journal*. <http://cjonline.com/news-education-state-government-state/2014-01-19/school-finance-shaped-history-lawsuits>.

36. Deke, J. (2003). A study of the impact of public school spending on postsecondary educational attainment using statewide school district refinancing in Kansas. *Economics of Education Review*, 22, 275–284.
37. Duncombe, W., & Yinger, J. (2000). Financing higher student performance standards: The case of New York State. *Economics of Education Review* 19, no. 4, 363–386; Reschovsky, A., & Imazeki, J. (2001). Achieving Educational Adequacy through School Finance Reform. *Journal of Education Finance*, 373–396; Imazeki, J., & Reschovsky, A. (2004). Is No Child Left Behind an un (or under) funded federal mandate? Evidence from Texas. *National Tax Journal*, 571–588; Imazeki, J., & Reschovsky, A. (2006). Does No Child Left Behind place a fiscal burden on states? Evidence from Texas. *Education Finance and Policy* 1, no. 2, 217–246; Imazeki, J., & Reschovsky, A. (2005). Assessing the use of econometric analysis in estimating the costs of meeting state education accountability standards: Lessons from Texas. *Peabody Journal of Education* 80, no. 3, 96–125.
38. Downes, T. A., & Pogue, T. F. (1994). Adjusting school aid formulas for the higher cost of educating disadvantaged students. *National Tax Journal*, 89–110; Duncombe, W., & Yinger, J. (1998). School finance reform: Aid formulas and equity objectives. *National Tax Journal*, 239–262; Duncombe, W., & Yinger, J. (1997). Why is it so hard to help Central City schools? *Journal of Policy Analysis and Management* 16, no. 1, 85–113; Duncombe, W., & Yinger, J. (2005). How much more does a disadvantaged student cost? *Economics of Education Review* 24, no. 5, 513–532.
39. See Baker, B. D. (2005). The emerging shape of educational adequacy: From theoretical assumptions to empirical evidence. *Journal of Education Finance*, 259–287; See also Andrews, M., Duncombe, W., & Yinger, J. (2002). Revisiting economies of size in American education: Are we any closer to a consensus? *Economics of Education Review* 21, no. 3, 245–262; Duncombe, W., Miner, J., & Ruggiero, J. (1995). Potential cost savings from school district consolidation: A case study of New York. *Economics of Education Review* 14, no. 3, 265–284; Imazeki, J., & Reschovsky, A. (2003). Financing adequate education in rural settings. *Journal of Education Finance*, 137–156; Gronberg, T. J., Jansen, D. W., & Taylor, L. L. (2011). The impact of facilities on the cost of education. *National Tax Journal* 64, no. 1, 193–218.
40. Jackson, C. K., Johnson, R., & Persico, C. (2015). *The effects of school spending on educational and economic outcomes: Evidence from school finance reforms*. (NBER Working Paper No. 20847). Cambridge, MA: National Bureau of Economic Research.
41. Baker, B. D., & Weber, M. (2016). Beyond the echo chamber: State investments and student outcomes in U.S. elementary and secondary education. *Journal of Education Finance*, 42(1), 1–27.
42. See also: Baker, B. D., Farrie, D., & Sciarra, D. G. (2016). Mind the gap: 20 years of progress and retrenchment in school funding and achievement gaps. *ETS Research Report Series*, 2016(1), 1–37.
43. Baker, B. D. (2016). *Does money matter in education?* Washington, DC: Albert Shanker Institute; Finn, J. D., & Achilles, C. M. (2009). Tennessee’s class size study: Findings, implications, misconceptions. *Educational Evaluation and Policy Analysis*, 21(2), 97–109; Finn, J. D., Gerber, S. B., Achilles, C. M., & Boyd-Zaharias, J. (2001). The enduring effects of small classes. *Teachers College Record*, 103(2), 145–183; Krueger, A. (2001). *Would smaller class sizes help close the black-white achievement gap?* (Working Paper No. 451). Princeton, NJ: Industrial Relations Section, Department of Economics, Princeton University; Levin, H. M. (2007). The public returns to public educational investments in African American males. *Economics of Education Review* 26(6), 699–708; Konstantopoulos, S., & Chun, V. (2009). What are the long-term effects of small classes on the achievement gap? Evidence from the lasting benefits study. *American Journal of Education*, 116(1), 125–154; Krueger, A. (1999). Experimental estimates of education production functions. *Quarterly Journal of Economics*, 114(2), 497–532; Dynarski, S., Hyman, J., & Schanzenbach, D. W. (2013). Experimental evidence on the effect of childhood investments on postsecondary attainment and degree completion. *Journal of Policy Analysis and Management*, 32(4), 692–717; Chetty, R., Friedman, J. N., Hilger, N., Saez, E., Schanzenbach, D. W. & Yagan, D. (2010). *How does your kindergarten classroom affect your earnings? Evidence from Project STAR* (NBER Working Paper No. 16381). Cambridge, MA: National Bureau of Economic Research; Lubienski, S. T., Lubienski, C., & Crawford-Crane, C. (2008). Achievement differences and school type: The role of school climate, teacher certification, and instruction. *American Journal of Education*, 115, 97–138.
44. Kim, J. (2006/2007). The relative influence of research on class-size policy. *Brookings Papers on Education Policy*, 273–295; Glass, G. V., & Smith, M. (1979). Meta-analysis of class size and achievement. *Educational Evaluation and Policy Analysis*, 1(1), 2–16.

45. Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The future of children*, 113–127; Nye, B., Hedges, L. V., & Konstantopoulos, S. (1999). The long-term effects of small classes: A five-year follow-up of the Tennessee class size experiment. *Evaluation and Policy Analysis*, 21(2), 127–142; Kim, J. (2006/2007). The relative influence of research on class-size policy. *Brookings Papers on Education Policy*, 273–295.
46. Dynarski, S., Hyman, J., & Schanzenbach, D. W. (2013). Experimental Evidence on the Effect of Childhood Investments on Postsecondary Attainment and Degree Completion. *Journal of Policy Analysis and Management*, 32(4), 692–717.
47. Dietrichson, J., Bøg, M., Filges, T., & Klint Jørgensen, A. M. (2017). Academic interventions for elementary and middle school students with low socioeconomic status: A systematic review and meta-analysis. *Review of Educational Research*, 87(2), 243–282. For a summary of the findings of this article, see: <https://fredrikdeboer.com/2017/05/16/study-of-the-week-what-actually-helps-poor-students-human-beings/>.
48. Murnane, R. J., & Olsen, R. (1989). The effects of salaries and opportunity costs on length of state in teaching: Evidence from Michigan. *Review of Economics and Statistics*, 71, 347–352.
49. Figlio, D. N. (1997). Teacher salaries and teacher quality. *Economics Letters*, 55, 267–271. Figlio, D. N. (2002). Can public schools buy better-qualified teachers? *Industrial and Labor Relations Review*, 55, 686–699; See also, Ferguson, R. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal on Legislation*, 28, 465–498.
50. Ferguson, R. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal on Legislation*, 28, 465–498; Greenwald, R., Hedges, L. V., & Laine, R. D. (1996). The Effect of School Resources on Student Achievement. *Review of Educational Research*, 66(3), 361–396; Loeb, S., & Page, M. (2000). Examining the link between teacher wages and student outcomes: The importance of alternative labor market opportunities and non-pecuniary variation. *Review of Economics and Statistics*, 82, 393–408.
51. Loeb, S., & Page, M. (2000). Examining the link between teacher wages and student outcomes: The importance of alternative labor market opportunities and non-pecuniary variation. *Review of Economics and Statistics*, 82, 393–408.
52. Ondrich, J., Pas, E., & Yinger, J. (2008). The determinants of teacher attrition in upstate New York. *Public Finance Review*, 36(1), 112–144.
53. Figlio, D. N., & Rueben, K. (2001). Tax limits and the qualifications of new teachers. *Journal of Public Economics*, 80(1), 49–71; See also Downes, T. A., & Figlio, D. N. (1999). Do tax and expenditure limits provide a free lunch? Evidence on the link between limits and public sector service quality. *National Tax Journal*, 52, 113–128.
54. Figlio, D. N. (1997). Did the “tax revolt” reduce school performance? *Journal of Public Economics*, 65(3), 245–269.
55. Carroll, S., Reichardt, R., & Guarino, C. (2000). *The distribution of teachers among California’s school districts and schools*. Santa Monica, CA: RAND Corporation; Sonstelie, J., Brunner, E., & Ardon, K. (2000). *For better or for worse? School finance reform in California*. San Francisco, CA: Public Policy Institute of California.
56. Policy Analysis for California Education (2000). *Crucial issues in California education 2000: Are the reform pieces fitting together?* Stanford, CA: Author.
57. Baker, B. D. (2014). *America’s most financially disadvantaged school districts and how they got that way: How state and local governance causes school funding disparities*. Washington, DC: Center for American Progress.
58. Adamson, F., & Darling-Hammond, L. (2012). Funding disparities and the inequitable distribution of teachers: Evaluating sources and solutions. *Education Policy Analysis Archives*, 20, 37. <http://epaa.asu.edu/ojs/article/view/1053>.
59. Baker, B. D., & Weber, M. (2016). State school finance inequities and the limits of pursuing teacher equity through departmental regulation. *Education Policy Analysis Archives*, 24, 47.
60. Baker, B. D., Farrie, D., & Sciarra, D. G. (2016). Mind the gap: 20 years of progress and retrenchment in school funding and achievement gaps. *ETS Research Report Series*, 2016(1), 1–37.

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