

The Road Toward K-12 Excellence in Michigan:

How an Upgraded Financing System Can
Better Support Enhanced Student Achievement

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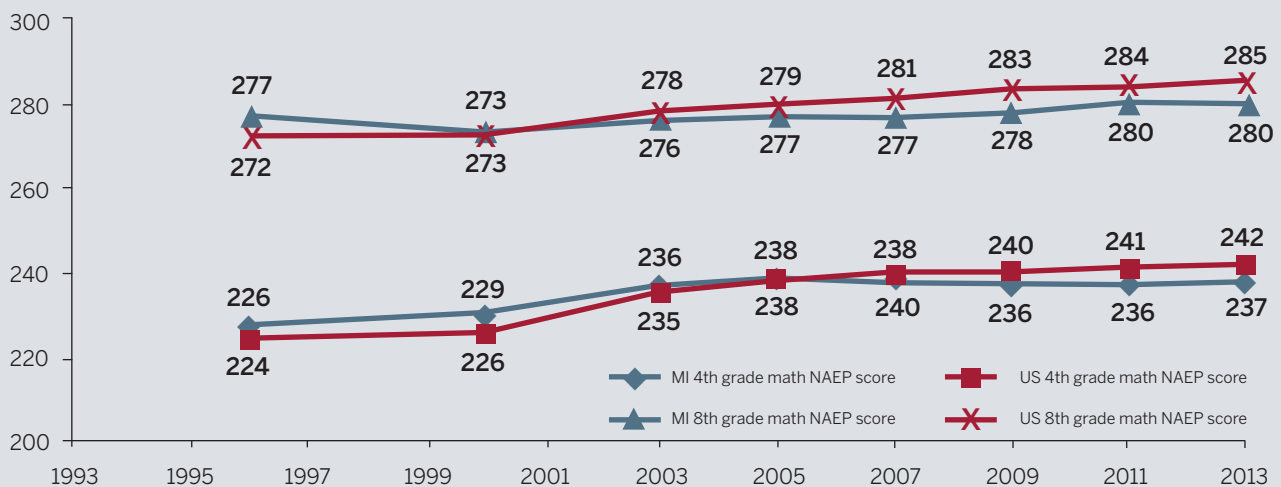
Executive Summary

Michigan has a problem. By several measures, the achievement of students attending its K–12 educational system has not kept pace with other states. Although Michigan’s student achievement has improved over the past decade, the improvement has been modest, and achievement in many other states has easily surpassed that in Michigan. Furthermore, despite a funding system based on an equitable allocation of resources, Michigan has persistent gaps in achievement across income groups that have not narrowed over time. These trends have grave consequences for the future of Michigan’s children as well as for Michigan’s economy. Substantial evidence shows that sagging test scores lower the future earnings potential of individuals and slow the economic growth of states. We believe it is time to accelerate the state’s educational and economic progress. It is time

for Michigan to begin to reclaim its legacy of educational excellence and equity.

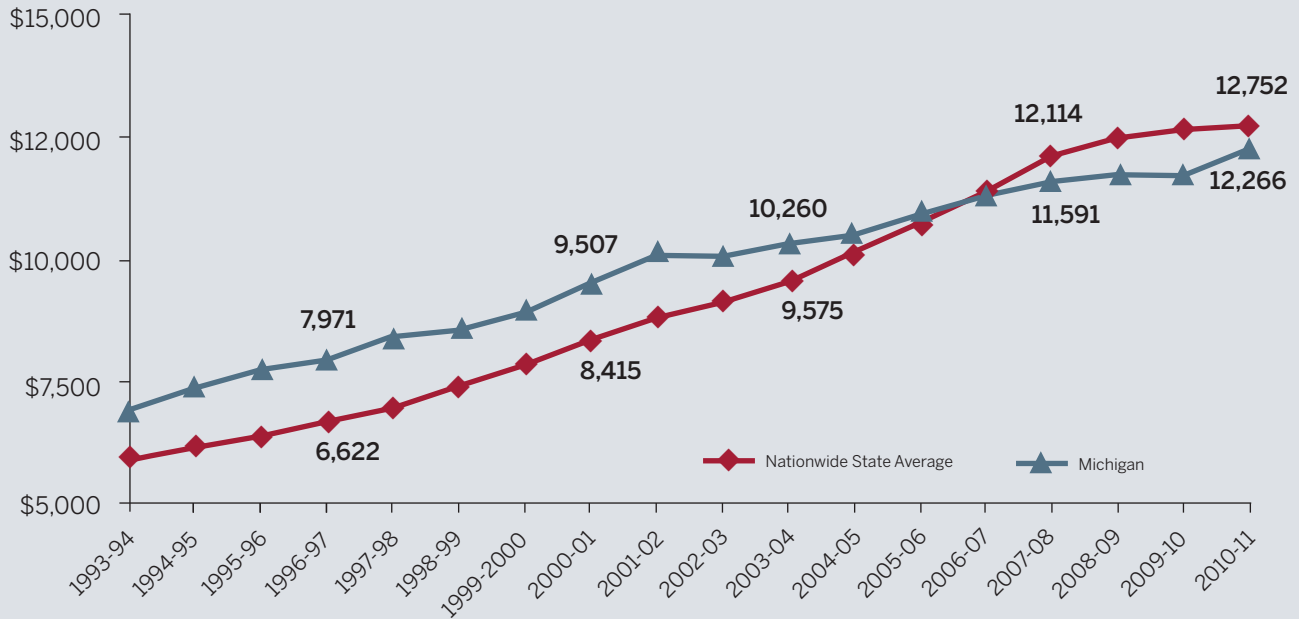
Addressing Michigan’s education problem requires additional resources. After spending the past 12 months conducting an extensive literature review and analyzing national and state data, researchers at the Upjohn Institute have concluded that resources are key to student academic success. More resources are needed to reach higher levels of achievement and to close the gaps in achievement between students from different socioeconomic backgrounds. Unfortunately, the situation with resources is quite similar to the situation with student achievement. Michigan has been slowly increasing resources for students, but virtually all other states have increased their spending faster. Thus Michigan is losing ground to its competitor states in terms of educational

Figure ES-1. Michigan and U.S. Math Scores on NAEP, by Year



SOURCE: National Assessment of Educational Progress (NAEP).

Figure ES-2. Michigan and U.S. Total Revenue per Pupil, by Year



SOURCE: National Center for Education Statistics, Common Core Data.

NOTE: Dollar figures are in nominal terms.

system investment. Figures ES-1 (Page ES-1) and ES-2 show how Michigan has ominously gone from above to below the national average in student achievement and total per-pupil revenue.

The Potential Economic Payoff

Michigan's standing vis-à-vis other states is not just a matter of state pride. Michigan's educational achievement disadvantages relative to the nation are sufficient to predict future earnings for Michigan students that are about 2 percent below what they would be if Michigan's test scores

matched the national average. Two percent may sound minor, but a 2 percent disadvantage added up over a career is a significant amount of money. On average, the present discounted value of a worker's earnings over her career is over \$900,000, so 2 percent extra earnings would have a present value of over \$18,000.¹ Applying an \$18,000 career earnings boost to each of the approximately 1.5 million K-12 students in Michigan results in a potentially huge total state benefit: over \$27 billion in the present value of extra career earnings for this group of students, and of course, as more students come into the system, the boost to the economy

¹ These calculations use very conservative assumptions. They rely on NAEP test scores for 2012, the relationship between test scores and lifetime earnings in Chetty et al. (2011), earnings of all individuals aged 16 to 80 in the 2012 American Community Survey (ACS), and a real discount rate of 3.0 percent. Present discounted values treat future earnings as less valuable than present earnings; that is, they are discounted to make them of comparable worth to today's earnings. The rationale is that money today could be invested and worth more than the same amount in the future, even after accounting for inflation.

grows even bigger. Thus there is a large economic stake to even small improvements in average academic achievement for Michigan's students.²

Limited State Resources

Given that Michigan's student achievement has lost ground compared to other states, and given the conclusion that more resources are needed to reach higher levels of achievement and to close the gaps, it would be easy to recommend that the state should appropriate significantly more funds in order to improve its K–12 system. However, that recommendation becomes difficult to make when one acknowledges that by many measures, Michigan is already among the leading states in the percentage of its fiscal capacity that gets spent on K–12 education. As a proportion of gross state product (GSP), the state spends more on K–12 education than any other states. The problem is that Michigan's fiscal capacity to fund K–12 education has declined. Michigan's GSP per capita has fallen from 23rd in 1992 to 30th in 2011, and its growth rate over this time ranks 49th among the states.

In a nutshell, prior to the last two decades, Michigan was a relatively affluent state that spent a relatively high amount of its resources on K–12 education. The two recessions in the 2000s—and Michigan's lack of recovery between them—and the decade-long restructuring of the auto industry devastated our state economy. So Michigan's fiscal capacity has shrunk, but legacy costs and an apparent commitment to education meant that the share of its fiscal capacity that goes to education has stayed relatively high.

Another Resource Issue

Not only is the level of resources important, but how those resources are spent also influences student achievement.

We suggest that the use of resources in Michigan may be skewed.

While Michigan ranks 26th in instructional expenditures per student, it ranks 40th in the percentage of K–12 revenue spent on instruction. Less than half of the revenue (from all sources) devoted to K–12 education in our state goes to instruction. Legacy costs, student support services, and declining enrollments have reduced the proportion of educational resources that are available for instruction. Michigan ranks 6th in the share of expenditures going to both employee benefits and student support services, which takes away money that could be spent on instruction. Therefore, stakeholders in the Michigan K–12 system need to establish policies and incentives that direct more revenue to classroom instruction in order to boost student achievement.

A Conundrum and Potential Solutions

Michigan is left with a conundrum. It is time to stop trailing its competitor states, and we believe that to do so will require resources. But the resource base in the state is quite limited. We believe that there are three potential solutions. First, because the situation is so dire, the state needs to “dig deep” and find *some* additional state resources. In the recommendations that we enumerate below, we suggest that these additional resources should be invested in an array of targeted initiatives.³ Second, we think that the resources that are extended to districts could and should be directed to proven instructional programs/interventions. We have entitled our recommended competitive grant program Smart Educational Expenditure Demonstration (SEED) grants. These grants would be limited to programs that have proven research evidence of large educational results per dollar spent.

²As is widely recognized, higher education is a route to higher lifetime earnings. Ruggles et al. (2010) documents both the lag between the percent of the population age 25 and over with at least an associate's degree in Michigan and the U.S. average, and that the size of the difference is growing. The current study does not specifically address higher education, but we would assert that it will be difficult to close the gap in higher education achievement between Michigan and the rest of the country when the gap in K–12 student achievement is widening.

³In our recommendations, we have used a target of an annual increase in the overall level of state funding of under \$600 million. This would represent an increase of less than 7 percent in overall school funding. It is, of course, up to the legislature to find the means, but we would point out that recent news reports (<http://www.detroitnews.com/story/news/politics/michigan/2015/02/18/michigan-business-tax-credit-liability/23614611/>) suggest that annual costs of ongoing MEGA business tax credits will be \$500 million to \$600 million per year for the next 15 years.

The third solution to the conundrum of needing, but lacking, resources is to expand the resource base to local property. Currently, local school districts have no ability to increase funding through property taxes.⁴ Whereas the Common Core Data of the National Center for Education Statistics (NCES) reports that, in Michigan, 30 percent of total revenues come from local sources, it should be recognized that local districts have virtually no discretion over these funds. The state has limited the local funding to a millage rate of up to 18.0 mills on non-homestead property, or in a very few districts to a hold harmless millage. As noted below, we recommend that proposal A should be amended to allow local districts to request voter approval for local millage enhancements that we believe should be subject to state equalization for property-value-poor districts. Furthermore, we advocate rigorous evaluation of the net impact of those funds on student achievement.

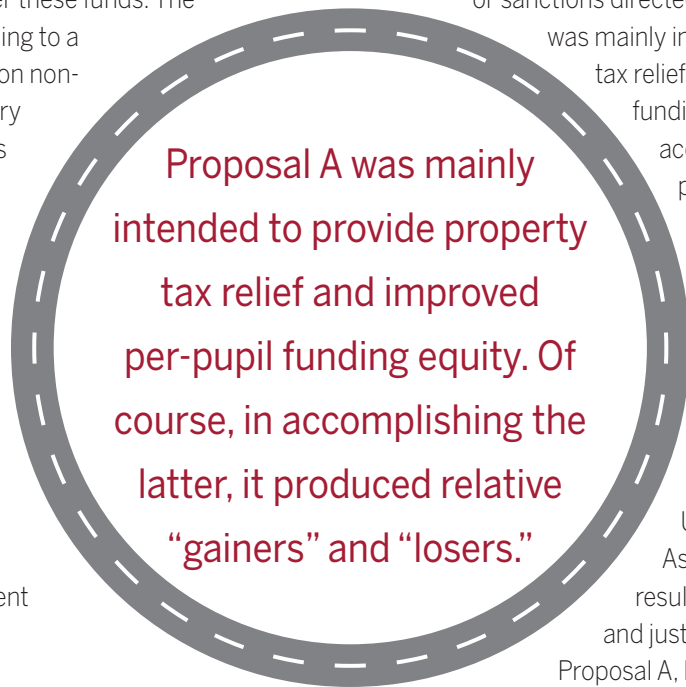
Proposal A and Its Shortcomings

In addition to calling for more resources, we believe that the current funding mechanism in the state — Proposal A foundation grant plus categoricals — needs to be adjusted. Prior to the 1994–95 school year, Michigan districts were funded by local property taxes that were equalized by the state. In the 1993–94 school year, for example, the state guaranteed districts \$102.50 per mill plus fixed-dollar payments per pupil of \$400. In the 1994–95 school year, with the implementation of Proposal A, the state funding mechanism drastically changed to a foundation grant system. Under the foundation grant system, the state

effectively sets two levels of operational funding per pupil: a guaranteed minimum, called the “effective basic foundation” grant, and a maximum level of support, called the “hold harmless threshold” level.

Proposal A was not promulgated as a school improvement initiative per se. It did not have any regulations, incentives, or sanctions directed at teaching and learning. It was mainly intended to provide property tax relief and improved per-pupil funding equity. Of course, in accomplishing the latter, it produced relative “gainers” and “losers.” To the extent that student achievement depends on funding levels, then we would expect that Proposal A would have had differential (relative) effects on student achievement that would favor the “gainers.” Using Michigan Educational Assessment Program (MEAP) results over the years just before and just after the implementation of Proposal A, Professor Leslie Papke from Michigan State University showed that for each

\$1,000 increase in per-pupil spending, there was an increase of between 2.2 and 3.7 percentage points in the 4th grade math passing rate. When she looked at schools in lower-spending districts that received greater funding increases after the implementation of Proposal A, the increase was between 3.2 and 10.3 percentage points; among schools in higher-spending districts, the increase was only between 1.3 and 2.6 percentage points. The MEAP passing rates went up for all schools, on average, but the lower-spending districts’ schools were the relative “gainers” when they received the additional revenue.



⁴Districts that comprise an intermediate school district (ISD) may ask voters in the ISD for an enhancement millage. Very few of these enhancement millages have succeeded because they require alignment of the needs and preferences of multiple districts that often have quite different needs and preferences.

In the first few years after Proposal A was implemented and Michigan's economy was growing, all was well. Virtually all districts got annual funding increases and experienced increases in student achievement. Furthermore, interdistrict equity was being achieved as "poorer" districts got relatively larger state funding increases and had larger gains in student achievement.

But in the 2000s, shortcomings in Proposal A's funding mechanism became apparent. The state's fiscal distress during this decade caused a rollback in the foundation grant level and categorical supports. The foundation grant was decreased by a nominal \$470 per student between the 2008–09 school year and the 2011–12 school year. Even despite recent growth in state revenues, the current foundation grant is less than the grant in the 2008–09 year. When adjusted for inflation, the foundation grant's reduction is even greater. Furthermore, a categorical source of funding for districts that were being held harmless, section 20(j), was vetoed in 2009 and has not been reinstated. With these cuts in per-pupil revenue, districts have had to find expenses to cut in order to maintain their fiscal balance.

Not only has the foundation grant been declining, but also student enrollment in most districts has been declining. In the 2002–03 school year, the state's enrollment was over 1.71 million students in K–12. This has declined to 1.52 million in 2013–14 (an 11 percent decrease) and is projected to decline to just over 1.50 million by 2015–16. If the number of districts in Michigan had remained constant, then this overall drop in enrollment would have meant that the typical district's enrollment dropped by 11+ percent between 2002 and 2014. However, the number of districts has not remained the same; there has been a dramatic increase in the number of districts due mainly to growth in public charter schools. So more than three-fourths of the traditional school districts that existed in the 2002–03 school year have experienced losses in enrollment and almost one-fourth of them have lost 25 percent or more.

Declining enrollment is a significant problem for districts because the reduction in expenditures that occurs when enrollment drops by a student is far less than the foundation grant that is lost. In other words, a loss of enrollment typically results in a small decline in costs, whereas the revenue associated with any student who leaves a district declines by the entire foundation grant. If a small number of students leave a district, they will most likely come from several different classrooms or schools. Class sizes may be slightly smaller, but the district will still have the same number of classrooms and schools, and, of course, the same number of teachers and building administrators, until a sufficient number of students leave to warrant reducing classes and teachers. If there are any cost savings, they would come from a reduction in materials and possibly from less time spent with individual students. Even if the enrollment decline does allow a cut in teaching staff, the teachers who are laid off will typically be lower paid, which reduces the savings to below the district's average costs.

The costs of educating a student may also vary substantially due to the student mix. Students from poverty backgrounds and English language learners (ELL) often times require smaller class sizes, mentors, more time on task, or other costly interventions in order to succeed. Michigan's categorical for at-risk students (31a) supplements the foundation grant, but in the current fiscal year, the level of assistance is around \$600 per student (free lunch or breakfast eligible), which is much less than supplements in other states.⁵ Note that if ELL students are not eligible for at-risk funding, then these costs must be borne by the district.⁶

Another cost differential is the cost of delivering instruction by grade level. Best practice for early elementary calls for smaller class sizes, which implies more teachers and higher costs per student, holding other things equal. Furthermore, some subject matters in the secondary grades, such as in the arts, sciences (lab courses), or career and technical

⁵The executive budget that has been presented to the Michigan legislature increases this categorical by about \$180 per eligible student for the next fiscal year. However, even with this increase, Michigan's support for these students pales compared to many other states.

⁶For an English language learner to be eligible for at-risk funding, he or she must also meet at least one of six other criteria.

education, may require materials and equipment, which make them more expensive on a per student basis. Thus, districts with relatively more small-sized elementary classrooms or relatively more expensive secondary class enrollments will have higher per student costs.

Other important differentials in cost that vary across districts are regional cost/price differentials and the amount of transportation provided by districts. In addition to its deficiencies with respect to operational costs, the Proposal A financing mechanism does not address at all the costs of capital improvements and infrastructure costs.

Traditional districts must use millages and thus depend on property values for major capital or infrastructure improvements. Charter schools do not have the opportunity to ask voters for millages, and so they must use their foundation grants or loans.

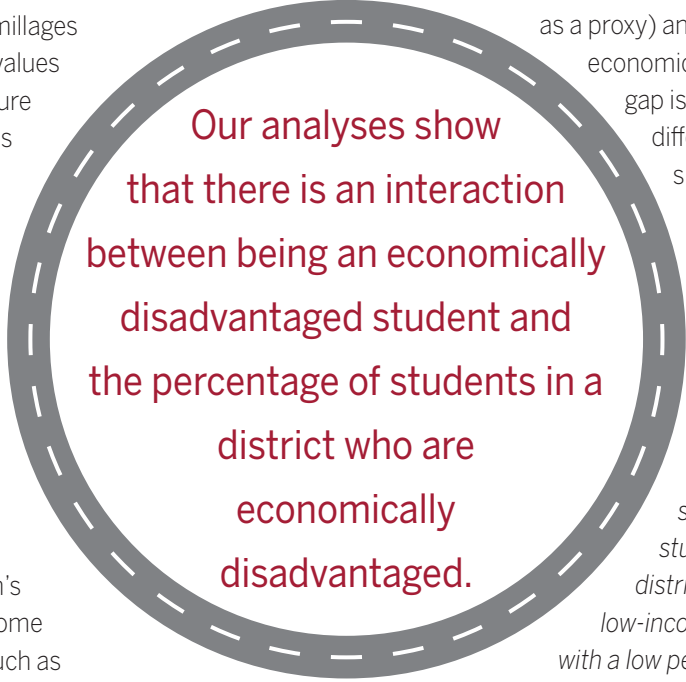
Despite these obvious differences in the cost of providing education across districts, Michigan's current funding mechanism does not take them into account when allocating revenue. The system's funding completely neglects some important cost differentials (such as declining enrollment, grade level differences, or regional cost differences) and barely addresses other cost differentials (such as economically disadvantaged students, English language learners, subject matter differences, or varied transportation requirements). In this study, we note that many other states, particularly leading states with better trends in achievement, do much more than Michigan to address such cost differentials. We recommend that Michigan take steps to begin to address these cost differentials as well.

Learners from Low-Income Families: Michigan Needs to Do Better

Attention to learners from low-income families is not just a matter of cost differentials. Students from low-income families, a disproportionate share of whom come from disadvantaged racial and ethnic groups, should have equal educational opportunities to other students. This becomes problematic upon consideration of the finding in our study that low-income students are essentially in double jeopardy. As is commonly known, there is a persistent achievement gap between economically disadvantaged students (for

which free or reduced price lunch eligibility serves

as a proxy) and students who are not economically disadvantaged, but this gap is typically measured as a difference in means. Our analyses show that there is an interaction (or feedback loop) between being an economically disadvantaged student and the percentage of students in a district who are economically disadvantaged. *In other words, the gap in test scores between low-income students and non-low-income students is much larger for districts with a high percentage of low-income students than for districts with a low percentage of low-income students.*



Our analyses show that there is an interaction between being an economically disadvantaged student and the percentage of students in a district who are economically disadvantaged.

What can or should be done for students from low-income households? We have identified several exemplary states based on growth in achievement scores for low-income and non-low-income students. All but one of these states invests at least \$1,000 more than Michigan in state funding per low-income student. For this and other reasons, we recommend restricting a substantial share of the SEED grant initiative to districts with at least 50 percent free or reduced price lunch enrollment and increasing substantially the funding that goes

to at-risk students. Furthermore, the at-risk funding needs to be progressive. This can be accomplished by weighting the funding by the share of low-income students.

The Study and Its Recommendations

Student achievement depends on a host of factors including student characteristics, curriculum and instruction, time on task, teacher quality, and parental and community support. Our study focuses on the financing of K-12 education in the state. To a large extent, finances determine the quality and quantity of instruction provided to the state's most precious resource: its children. After a brief introductory chapter, the second chapter of this report explains how Proposal A radically altered the funding of K-12 education in Michigan's school districts, reviews studies of the influence of that funding change on student achievement — including supplementary analyses by our research team — and points out the unintended consequences of Proposal A. The fact that the state imposed a substantial change in its funding mechanism in a relatively short span of time prompted a number of studies, as researchers felt that the exogeneity of the change could be used to identify the causal effect of funding on achievement. Whereas the implementation of Proposal A gave researchers an opportunity to identify the impact of money on student achievement, it has also, over the years, been shown to have shortcomings that should be resolved.

Following the background chapter on Proposal A, the next chapter of this report examines student achievement in Michigan and other states. The cross-state comparisons use NAEP data, which is the only source of information that can be used for this sort of comparative analysis. In addition, we use MEAP data to examine student achievement results in Michigan that extend beyond previous studies. The chapter also addresses the methodology and data that we used to select seven exemplary states that may hold useful lessons for Michiganders.

The fourth chapter delves into education financing. It provides detail about the mechanisms used in other states,

with particular emphases on the seven states identified as exemplary in student achievement. The chapter also examines how and why recent reforms have been undertaken. Finally, it reviews studies that have shown how these and other school finance reforms have affected student achievement and other outcomes.

The final chapter of the report focuses on recommendations based on our analyses and review of existing evidence. Among these recommendations are the following:

- The state should implement a four-year competitive grant program for districts (traditional and charter schools) to offer services/interventions that have been shown to be more effective at increasing student achievement than simply expanding resources. The districts that receive grants will be required to evaluate the efficacy of their service/intervention. A funding level of \$200 million for this Smart Expenditure Educational Demonstration (SEED) initiative will serve 200,000 Michigan students. Two-thirds of the funding should be reserved for districts with over 50 percent of students eligible for free or reduced price meals. (Estimated annual state funding level: \$200 million.)
- Proposal A should be altered to allow local districts to request from taxpayers enhancement millages of up to 3.0 mills per year for a maximum of five years. These enhancement millages would be used only for operating (and not capital) expenses. The state should supplement the millages that are approved in districts that are relatively poor in property value. (Estimated annual state funding level: \$150 million.)
- The state should ensure that its legislatively mandated adequacy study be rigorous, using an econometric analysis of cost data as well as qualitative data from experts concerning what constitutes best practice in instruction for all students in all grade levels as well as necessary

non-instructional activities. These qualitative data need to be converted to costs in a fully documented manner. (Estimated total state funding level: \$1 million [already in budget].)

- The state should increase its funding level and institute a progressive funding structure for fund aid for at-risk students (the section 31a categorical). Michigan's current extra funding for low-income students is very low compared to the practices of states that are outpacing it in educational achievement gains, and our funding practices need to change, both to increase overall achievement and to provide for greater equity in opportunities. In addition to increasing the at-risk funding level for the state as a whole, we propose adding a premium to the per-student allocation of at-risk funds of 0.50 times the percentage of students who are eligible for free or reduced price lunch. A district with 100 percent low-income students would receive 1.5 times the at-risk funding per pupil as a district with no low-income students. (Estimated annual increase in state funding level: \$200 million.)
- For districts that have declines in enrollment of more than 2 percent in a year, state aid should include a declining enrollment adjustment that equals one-half of the foundation grant times the net enrollment loss. (Estimated annual state funding level: \$20 million.)
- Michigan should alter Proposal A to provide adjustments to the per-student foundation grant that weights more heavily enrollments in grades

1–3 and grades 9–12, where costs are higher. Furthermore, increasing the level of funding for grades 9–12 will be an incentive to districts to reduce their high school dropout rates. (Estimated increase in state funding level: \$0.)

We note that we did not attempt to address the funding of legacy costs, technology, or capital infrastructure in this study.

Only a Beginning

As we conducted our analyses, it became apparent that Michigan's lagging economy has been detrimental to the state's educational achievement and limits severely the state's ability to improve its K–12 system. The recommendations we offer are only the first steps on the road toward excellence.

We believe that successfully traversing that road will require a unified commitment to excellence by all policymakers, education practitioners, and citizens. The means will come from accelerated economic growth over the long run. Ironically, it will require substantial investments in an improved education system to achieve that growth.

Our intent is for the ideas and recommendations presented in this report to spark debate and dialogue among policy makers, the public, the media, and other stakeholders about how K–12 funding is raised, how it is allocated, how it is spent, and how it contributes to academic achievement in our state.

I: Introduction

Michigan is a state in which education has been accorded high priority by policymakers, parents, businesses, educational watchdog organizations, the media, and others; yet student achievement has been stagnant over the last decade. Test score measures of student achievement have been flat, and the gaps between economically disadvantaged students and other students have widened as compared to other states. In relative rankings, Michigan has slipped considerably from the middle to the bottom quintile of states. The slippage is not a matter of declining levels of achievement in Michigan. Rather, it is a matter of increasing achievement in other states, while achievement in this state has stalled.

Michigan's standing vis-à-vis other states is not just a matter of state pride. Michigan's disadvantages relative to the nation are sufficient to predict future earnings for Michigan students that are about 2 percent below what they would be if Michigan's test scores matched the national average. Two percent may sound minor, but a 2 percent disadvantage added up over a career is a significant amount of money. On average, the present discounted value of a worker's earnings over her career exceeds \$900,000, so 2 percent extra earnings would have a present value of over \$18,000.⁷ Applying an \$18,000 career earnings boost to each of the approximately 1.5 million K–12 students in Michigan results in a potentially huge total state benefit: over \$27 billion in the present value of extra career earnings for this group of students. Thus there is a large economic stake to even small improvements in average academic achievement for Michigan's students.

It is, of course, the case that student achievement depends on a host of factors such as student characteristics,

curriculum and instruction, time on task, teacher quality, and parental and community support. Our study focuses on the financing of K-12 education in Michigan. Just over 20 years ago, Michigan altered significantly its K–12 funding mechanism with the passage of Proposal A. This change has greatly influenced the level and distribution of funding available to school districts over the years since its passage. Proposal A addressed funding inequities across districts, which were one motivation for its passage. However, it has had some unintended consequences that suggest that it may be time to consider modifying or replacing it.

The purpose of this study is to take a hard look at Proposal A and trends in student achievement and education financing in Michigan relative to other states. It considers whether the funding mechanism in Michigan may be disadvantageous for some students and makes recommendations as to how that funding mechanism can be improved.

The next chapter of this report explains how Proposal A radically altered the funding of K–12 education in Michigan's school districts, reviews studies of the influence of that funding change on student achievement, documents statistical analyses undertaken by our research team concerning the effect of resources on student achievement, and points out the unintended consequences that were alluded to above. The state's imposition of such a substantial and rapid change in its funding mechanism prompted several studies as researchers felt that the "exogeneity" of the change could be used to identify the causal effect of resources on achievement. That is, Proposal A was a "natural experiment," wherein some districts' educational spending was increased significantly relative to other districts because of a sudden state policy change. Whereas

⁷This average considers both workers whose career paths would be unaffected by changes in test scores and workers whose career paths (and earnings) would be substantially altered by change in these scores. These calculations rely on National Assessment of Educational Progress (NAEP) test scores for 2012, the relationship between test scores and lifetime earnings in Chetty et al. (2011), earnings of all individuals aged 16–80 in the 2012 American Community Survey (ACS), and a real discount rate of 3.0 percent.

the implementation of Proposal A gave researchers an opportunity to identify the impact of money on student achievement, it has also, over the years, been shown to have shortcomings that should be resolved.

Following the background chapter on Proposal A, the next chapter of this report examines student achievement in Michigan and in other states. The cross-state comparisons use data from the National Assessment of Educational Progress (NAEP), which is the only source of information that can be used for this sort of comparative analyses. In addition, we use Michigan Educational Assessment Program (MEAP) data to examine student achievement results in the state. Since the purpose of the study is to suggest ways that the funding mechanism in Michigan might be changed in order to improve student outcomes, it is appropriate to examine comparable data across states to identify those that are successful. Using criteria that look at test score levels, trends over time, and gaps between economically disadvantaged students and non-economically-disadvantaged students, we have selected seven exemplary, successful states that may hold useful lessons for Michiganders.

The fourth chapter delves into education financing. It provides some detail about the mechanisms used in other states with particular emphases on the exemplary states. An important part of the chapter is its consideration of the fiscal capacity of Michigan to provide additional resources. Finally, it also reviews studies that have shown how school finance reforms have affected student achievement and other outcomes.

The final chapter of the report focuses on recommendations based on our analyses and review of existing evidence. The details of and rationales for these recommendations are presented in the last chapter. Our intent is for the ideas and recommendations presented in this report to spark debate and dialogue among policymakers, the public, the media, and other stakeholders about how K–12 funding is raised, allocated, and spent, and how it contributes to academic achievement in the state.

II: School Financing in Michigan

A little over two decades ago, Michigan made a dramatic change in the way that it funded its K–12 educational system. This chapter reviews the history of the change and discusses studies of the effects of that change on student achievement. The change from a system that relied on local funding to one that used state-funded foundation grants has had positive impacts on student achievement, according to published studies. Upjohn Institute staff members replicated these studies with a longer panel of data, and found results consistent with the earlier studies. Nevertheless, Proposal A seems to have resulted in fiscal instability in districts experiencing significant enrollment changes. The general trend in enrollments is downward over the past decade, as the state has lost population. In addition, the financial instability of districts has been exacerbated by the trends in charter school enrollments and interdistrict choice programs. Thus, it may be time to alter the funding mechanism of Proposal A.

A. Proposal A

In March 1993, the Kalkaska School District closed its doors to students because local voters had voted down an operating millage for the schools for the third time, and the district's school board decided that closing the schools altogether was its best option. Students were denied almost three months of education. At commencement on March 28th (instead of the planned end of school in early June), the senior class president said that he hoped that Kalkaska's difficulty would lead to a change in school funding in Michigan. While school funding inequity may not have been the primary reason for the change in school funding, the class president's wish came true with the passage of Proposal A in March of the following year.

Prior to the 1994–95 school year, Michigan districts were funded by local property taxes that were partially equalized by the state. In the 1993–94 school year, for example, the state guaranteed districts \$102.50 per mill plus fixed-dollar payments per pupil of \$400.⁸ In a district whose property values were quite low, say a state equalized value (SEV)⁹ of \$80,000 per pupil, a tax rate of 30 mills would generate \$2,400 in local revenue ($0.030 \times \$80,000$). Since the state guaranteed minimum for that district would be \$3,475 ($\$102.50 \times 0.030 + \400), state aid per pupil would be \$1,075 (the difference between the state guaranteed minimum and local revenue). If a district had much higher property values, say an SEV of \$400,000 per student, and a 30 mill tax rate for schools, then its local revenue per student would be \$12,000. Because the local revenue per pupil exceeded the state guarantee, such a district would be “out of formula” and it would receive no state aid.

The problems with this funding formula were that it was inequitable and that state support could fluctuate *within* the budget year. The inequity can be seen in the two districts described above that have the same tax rate but different per-pupil revenue, even after state support, of more than \$8,500 ($\$12,000 - \$3,475$). The instability in the state support occurred because the state guaranteed minimum was based on budget and enrollment estimates, but the actual levels paid out depended on realized enrollments, local millage rates, and SEVs that could change during the year. If such changes led to total state aid exceeding the budgeted amount, state aid would be adjusted downward in order for the budget to balance, disproportionately cutting payments to poorer districts.

Under this system, the state provided 37 percent of the combined local and state funding for K–12 education in

⁸The \$400 was composed of a flat grant of \$326 per pupil, plus \$74 in incentive payments.

⁹A property's SEV is equal to one-half of its assessed value.

Table 2-1. Proposal A Parameters and Gap between Michigan’s Maximum Funded District and Its Minimum Funded District, by Year

Fiscal Year	Effective Basic Minimum	Growth in Effective Basic	Hold Harmless (HH) Threshold	Growth in HH Threshold	District Maximum	District Maximum Minus District Minimum
1993–94	\$2,762	n/a	n/a	n/a	\$10,294	\$7,532
1994–95	4,200 ^a	n/a	6,500	n/a	10,454	6,254
1995–96	4,506 ^a	306	6,653	153	10,607	6,101
1996–97	4,816 ^a	310	6,808	155	10,762	5,946
1997–98	5,124 ^a	308	6,962	154	10,916	5,792
1998–99	5,170 ^a	46	6,962	0	10,916	5,746
1999–00	5,700	430	7,200	238	11,154	5,454
2000–01	6,000	300	7,500	300	11,454	5,454
2001–02	6,500	500	7,800	300	11,754	5,254
2002–03	6,700 (pro-rated to 6,626)	200	8,000	200	11,880	5,254
2003–04	6,700 (pro-rated to 6,626)	0	8,000	0	11,880	5,254
2004–05	6,700	0	8,000	0	11,954	5,254
2005–06	6,875	175	8,175	175	12,129	5,254
2006–07	7,108	233	8,385	210	12,339	5,231
2007–08	7,204	96	8,433	48	12,387	5,183
2008–09	7,316	112	8,489	56	12,443	5,127
2009–10	7,316 (cut to 7,162)	0	8,489	0	12,170 ^b	5,008
2010–11	7,316 (cut to 7,146)	0	8,489	0	12,154	5,008
2011–12	6,846	(470)	8,019	(470)	11,854	5,008
2012–13	6,966	120	8,019	0	11,854	4,888
2013–14	7,076	110	8,049	30	11,884	4,808
2014–15	7,251	175	8,099	50	11,934	4,733

NOTE: The 1993–94 fiscal year is pre-Proposal A. The district maximum column is the state revenue for Bloomfield Hills, which is the highest per-pupil-funded district with at least 10 enrolled students. At various times, fixed per-pupil equity payments were built into the basic level: a \$200 payment was instituted in FY 2001–02, a \$23 payment was added in FY 2006–07, and a \$125 payment was added in FY 2014–15. There have also occasionally been mid-year cuts during budgetary shortfalls: in FY 2002–03 and FY 2003–04, state aid payments were cut by \$74 per pupil in all districts without any alteration to the statutory minimum or threshold; and in FY 2009–10 and FY 2010–11, there were analogous reductions in state aid of \$154 and \$170, respectively. All entries are in nominal dollars.

^aDuring the first five years of Proposal A implementation, the state had separate “effective minimum” and “effective basic” levels of funding. These figures are the former and are the amounts actually used. The “effective basic” started at a value of \$5,000 in 1994–95, which was felt to be the desirable minimum support, but presumably would have required an infeasible level of state support. The two concepts were unified starting with SFY 1999.

^bSection 20j categorical veto is built into this figure.

SOURCE: Senate Fiscal Agency, 2014a.

Michigan. In the 1994–95 school year, with Proposal A, the state funding mechanism drastically changed to a foundation grant system. With the enactment of Proposal A, the state's share of combined state and local funding rose dramatically to 80 percent. Under the foundation grant system, the state effectively sets two levels of operational funding per pupil: a guaranteed minimum, called the effective basic foundation grant, and a maximum level of support, called the hold harmless threshold (or basic)¹⁰ level.

The foundation allowance for a district may be at the guaranteed minimum (where most districts are), may be between the minimum and the hold harmless threshold level, or may be greater than the threshold. From year to year, districts at the minimum level all receive the same increase (or decrease), which is the change in the guaranteed minimum set by the state. Districts with funding that is greater than the basic (threshold) level all receive the same increase (or decrease), which is the change in the threshold level (this change is always less than or equal to the change in the minimum). Districts in between the two levels receive a pro-rated change level that is between the change in the minimum and the threshold. The intent of Proposal A is to reduce the disparity in the levels of funding per pupil across districts by increasing the basic foundation grant faster than the maximum support level, so that eventually all districts would be equalized or close to equalized, and there would be no local hold harmless millages.

State funding comes from a variety of revenue sources, but mainly from a substantial portion of the state sales tax, a portion of the state income tax, the real estate transfer tax, and a 6.0 mill education property tax. Local funding mainly comes from two sources. Districts may levy up to 18.0 mills (over and above the 6.0 state millage rate) on non-homestead property with voter approval; and if districts have had historically high levels of revenue per pupil, they may levy a hold harmless millage on homestead and non-homestead property, again with voter approval. Local funding may also

be raised through an enhancement millage of up to 3.0 mills that must be approved by voters in the district's intermediate school district.

Table 2-1 on the previous page shows the statutory changes in the effective basic, hold harmless threshold, and maximum district levels of funding in the year prior to the passage of Proposal A and over the years since it was implemented. The final column in the table shows the maximum funding gap in the state. Note that the change in the threshold, or maximum support, level is always equal to or less than the change in the effective basic grant, or minimum support level. The funding gap that is displayed in the final column of the table, which is a measure of the improvement in equity among districts, steadily decreases from over \$7,500 in the year immediately before Proposal A to \$4,733 in the current fiscal year. After an immediate decrease in this gap of \$1,278 in the year that Proposal A was implemented, the gap has gradually narrowed by another \$1,521, or about 25 percent, over the intervening 21 years.

Table 2-2 on Page 6 adjusts the funding levels displayed in Table 2-1 for inflation. The entries in that table show that districts that just receive the basic foundation grant have in recent years received per-pupil funding that is almost precisely the same, in inflation-adjusted dollars, as the funding in 1996–97. However in the intervening years, the effective basic funding in real dollars increased by over 20 percent before falling back to its earlier level. Districts whose funding levels were at or near the state's maximum foundation grant (at the hold harmless threshold level) have seen the state per-pupil support fall by approximately 20 percent in real terms over the past 20 years. In real terms, the gap between the maximum and minimum district per-pupil funding has decreased significantly. It dropped by 19.1 percent in the first year that Proposal A was implemented, and then it fell by about 52 percent over the succeeding 21 years.

¹⁰ The word "basic" is used to mean two different concepts. The minimum foundation grant is referred to as the Effective Basic grant (see Senate Fiscal Agency 2014a), and the threshold level is called the Basic grant (see Senate Fiscal Agency 2014b).

Table 2-2. Proposal A Parameters and Gap between Michigan's Maximum Funded District and Its Minimum Funded District, in Real Dollars, by Year

Fiscal Year	Effective Basic Minimum	Growth in Effective Basic	Hold Harmless (HH) Threshold	Growth in HH Threshold	District Maximum	District Maximum Minus District Minimum
1993-94	\$4,448	n/a	n/a	n/a	\$16,578	\$12,130
1994-95	6,588	n/a	10,195	n/a	16,397	9,809
1995-96	6,893	305	10,177	(18)	16,225	9,332
1996-97	7,130	237	10,079	(98)	15,933	8,803
1997-98	7,459	329	10,134	55	15,890	8,431
1998-99	7,406	(53)	9,974	(160)	15,638	8,232
1999-00	7,952	546	10,045	71	15,561	7,609
2000-01	8,097	145	10,121	76	15,456	7,360
2001-02	8,637	540	10,365	244	15,619	6,982
2002-03	8,696 (pro-rated to 8,600)	59	10,384	19	15,420	6,820
2003-04	8,536 (pro-rated to 8,442)	(160)	10,192	(192)	15,135	6,693
2004-05	8,267	(269)	9,871	(321)	14,749	6,482
2005-06	8,202	(65)	9,754	(117)	14,471	6,268
2006-07	8,270	68	9,756	2	14,357	6,086
2007-08	8,055	(215)	9,429	(327)	13,850	5,795
2008-09	8,168	113	9,478	49	13,892	5,724
2009-10	7,956 (cut to 7,789)	(212)	9,232	(246)	13,235	5,446
2010-11	7,837 (cut to 7,655)	(119)	9,093	(139)	13,019	5,364
2011-12	7,122	(715)	8,342	(751)	12,332	5,210
2012-13	7,124	2	8,201	(141)	12,122	4,998
2013-14	7,131	7	8,111	(90)	11,975	4,844
2014-15	7,251	120	8,099	(12)	11,934	4,733

NOTE: Table entries are from Table 2-1 converted to 2014-15 dollars, using CPI-U.

B. Impact of Proposal A on Student Achievement

Proposal A was not promulgated as a school improvement initiative, per se. It did not have any regulations, incentives, or sanctions directed at teaching and learning. It was mainly intended to provide property tax relief and improved per-pupil funding equity. Of course, in accomplishing the latter, it produced relative “gainers” and “losers,” as some districts gained greater increases in state support than others. To the extent that student achievement depends on funding levels, we would expect that Proposal A would disproportionately benefit student achievement in “gainer” districts.

Papke (2005) carried out the first analysis that used Proposal A to estimate the effect of spending changes on student achievement, and therefore to indirectly identify the effects of Proposal A on student achievement. Using school-level data from the MEAP for 4th grade mathematics over the seven-year period from 1991–92 to 1997–98, Papke estimated the impact of spending on passing the test — scoring above the cut score, i.e., receiving a satisfactory. Her results suggest that for each \$1,000 increase in per-pupil spending, the 4th grade math passing rate increased by between 2.2 and 3.7 percentage points. When she looked at schools in lower spending districts that received relatively more funding after the implementation of Proposal A, the increase was between 3.2 and 10.3 percentage points. In contrast, schools in historically higher spending districts experienced passing rates that rose between 1.3 and 2.6 percentage points. Over the period, the MEAP passing rates went up for all schools, on average, but the lower spending districts’ schools were the relative “gainers.”

In a subsequent paper, Papke (2008) uses a longer panel of data, both pre- and post-Proposal A, to attempt to replicate her earlier results. Even though the per-pupil funding equalization slowed in the early 2000s, the author finds it was still the case that the impact of higher levels of resources was more than three times as great for lower-spending districts as for higher-spending districts.

Roy (2011) also examines the impact of Proposal A on academic achievement. He focuses on two aspects of Proposal A: the relative increase in per-pupil revenue in lower-spending districts and the loss of significant local control over revenue (and thus spending) of all districts because of the imposition of state decision making. Similar to Papke, he hypothesized that districts with larger increases in revenue as a result of Proposal A would exhibit gains in student achievement relative to initially higher-spending districts. But in addition, he hypothesized that the lack of local discretion in spending increases would have a negative effect on student performance in higher-spending districts.

Using 4th grade MEAP data from 1990 through 2001 for reading and mathematics, Roy (2011) employs a cohort analysis to empirically confirm that passing rates in the lowest-spending districts increased faster than those in higher-spending districts. Applying an instrumental variable approach to establish causality, he finds an increase in the passing rate on the reading test of between 3 and 6 percentage points for every \$1,000 in additional per-pupil revenue. This translates to an effect size of between 0.20 and 0.40 standard deviations. For mathematics, the results are slightly stronger: an increase of between 6 and 8 percentage points for every \$1,000 in additional per-pupil revenue, or an effect size of between 0.40 and 0.55 standard deviations. These results suggest that during the years 1994–95 through 1998–99, the districts that received the basic foundation grant — which increased by \$970 over the period — had increases in 4th grade MEAP passing rates of between 3 and 6 points for reading and between 6 and 8 points for math. Districts during those years that received the state maximum grant — which increased by only \$462 — had increases of half the magnitude, leading to a narrowing of the achievement gap across districts.¹¹

Roy is much more circumspect about his second hypothesis. In this case, he suggests that the deterioration in MEAP results of districts in the highest quintile of spending relative

¹¹However, he found no statistically significant impact of changes in per-pupil spending on ACT-taking rates or ACT scores.

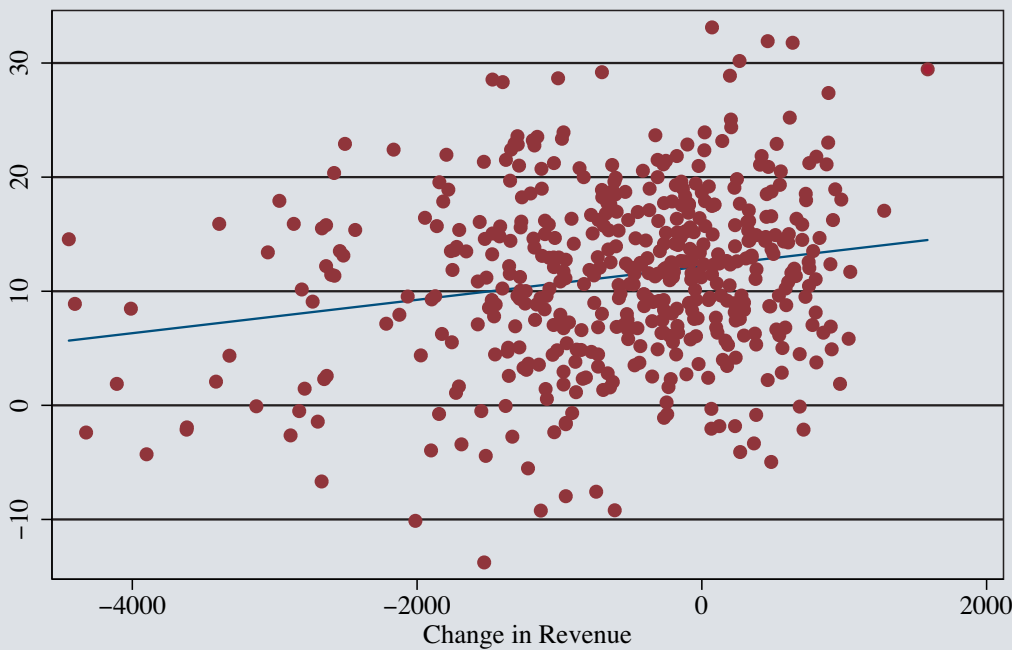
to all other districts *may* result from less control over revenue in the years after the implementation of Proposal A.

C. Further Analyses of Proposal A

The studies that look at the impact of Proposal A on student achievement suggest that resources matter. The districts that received the largest increases in funding had the largest increases in student achievement. From a social science perspective, Proposal A can be viewed as a good “natural experiment” to see what happens when a state makes large and variable changes in real revenue per pupil across different school districts. The reform effectively increased revenue per pupil in many school districts, particularly lower-income rural school districts, and these districts showed greater improvements in academic performance.

We have replicated and extended the analyses of Papke (2005, 2008) and Roy (2011). Figure 2-1 shows the estimated relationship among Michigan school districts between the 20-year change in real state and local revenue per pupil from 1993 (just before Proposal A) to 2013 and the change in the passing rate on the MEAP test. The regression line shown in the figure indicates a statistically significant positive relationship between the two changes. In particular, the slope of the line suggests that a district’s passing rate on the MEAP increases about 1.5 percentage points when its (inflation-adjusted) per-pupil revenue rises by \$1,000. (Adding additional control variables to the regression reduces the slope to about 1.2 percentage points, but it remains statistically significant.)

Figure 2-1. Change in Average MEAP Passing Rate Between 1993 and 2013, by Change in Real State and Local Revenue per Pupil



NOTE: Each point is a Michigan school district. The horizontal axis shows the change in real state and local general funding per pupil between 1993, just before Proposal A, and 2013. The vertical axis shows the change in the average MEAP passage rate over all the reading and math MEAP tests given in that district. Without controls, the regression line has an estimated coefficient of 1.46 (t-statistic of 4.44) per \$1,000 dollar change in per-pupil funding. Controlling for the change in the share of students in a district who are low income lowers the coefficient slightly to 1.33 (t-stat = 4.29). Additionally controlling for the initial period’s funding level and MEAP pass rate further lowers the coefficient to 1.16 (t-stat = 2.95).

SOURCE: Michigan Educational Assessment Program (MEAP).

Later in this document, we use these results to extrapolate the amount of additional resources that it would take to upgrade Michigan's student achievement to the level of the U.S. average and to the level of exemplary states, as well as the resources it would take to reduce gaps between disadvantaged and non-disadvantaged students. These extrapolations assume that the status quo delivery of teaching and learning (i.e., classroom productivity) is unchanged. An emphasis of our study is that more resources are needed and that any additional resources invested in the system should be used on interventions or strategies that have been shown to be effective.

D. If Student Achievement Generally Rose with Proposal A, What's Not to Love?

School districts (charter and traditional) are private nonprofit or public entities. As such, they are not intended to make a profit, nor can they sustain large or long-lasting losses. It is important, then, that changes in costs from year to year (i.e., marginal costs) get approximately balanced by changes in revenue (marginal revenue). A single foundation grant system, such as that imposed by Proposal A, is inflexible by design. The inflexibility of the Proposal A mechanism tends to hurt very rapidly growing school districts (traditional or charter) and districts that are experiencing declining enrollment. In the former case, the per-student cost of expansion is likely to exceed the foundation grant. In the latter case, the cost *reduction* is likely to be less than the reduction in revenue.

Unfortunately, several events have stressed the financial status of many districts: state fiscal distress that caused a rollback in the foundation grant level and categorical supports, declining student enrollment in the state, and an increased number of districts. As noted in Table 2-1, after fairly steady growth in the foundation grant between 1994 and 2008 (with the exception of two temporary cuts in the early 2000s), the foundation grant was reduced by \$470 per student between the 2008–09 school year and the 2011–12 school year. Despite growing state revenues, the current foundation grant in nominal terms is less than it was

in the 2008–09 year. Furthermore, a categorical source of funding for districts that were being held harmless, section 20(j), was vetoed in 2009 and has not been reinstated. With these cuts in per-pupil revenue, districts have had to cut expenses in order to maintain their fiscal balance.

If we adjust for inflation, the recent financial trends for Michigan schools are much more unfavorable. For example, in Table 2-1, from the 2008–09 school year to the 2014–15 school year, the effective basic minimum foundation grant declined in nominal terms, without adjusting for inflation, from \$7,316 per student in 2008–09 to \$7,251 per student in 2014–15. In nominal terms, this is a decline of only 0.9 percent. If we adjust for increasing prices, Table 2-2 shows that the \$7,316 per student in 2008–09 would be equivalent to \$8,168 in 2014–15 dollars. The actual \$7,251 per student in 2014–15 then represents an 11.2 percent decline in real resources per student. Inflation in costs is a reality that districts have to deal with — costs of buying inputs such as fuel for buses or textbooks or other supplies go up with inflation, and schools face pressures for wages to keep pace with inflation in order to stay competitive in the labor market.

Unfortunately, Kalkaska-like situations are arising again in Michigan, as two districts closed their doors due to insolvency in 2013, and more than 50 others are close to bankruptcy (Michigan Department of Education 2014). Clearly, Proposal A has not prevented fiscal distress in Michigan's school districts. The problem is mainly the vicious circle created by declining enrollment. This vicious circle comprises the cycle of enrollment losses causing revenue losses, which necessitate program cuts that impair educational quality, that precipitate further enrollment losses.

The primary source of revenue for districts is state and local aid that is essentially composed of the foundation grant multiplied by student enrollment. Not only has the foundation grant been declining, but for most districts,

student enrollment has also been declining. In the 2002–03 school year, the state’s K–12 enrollment was over 1.71 million students. It declined to 1.52 million in 2013–14 (an 11 percent decrease), and it is projected to decline to 1.50 million by 2015–16. If the number of districts in Michigan had remained constant, then this overall drop in enrollment would have meant that the typical district’s enrollment dropped by about 11 percent between 2002 and 2014. However, mainly because of the growth in public charter schools, the effective number of districts has increased considerably, raising the costs of overhead and administration. More than three-fourths of the traditional school districts that existed in the 2002–03 school year have experienced losses in enrollment; almost one-fourth of them have shrunk by at least 25 percent.

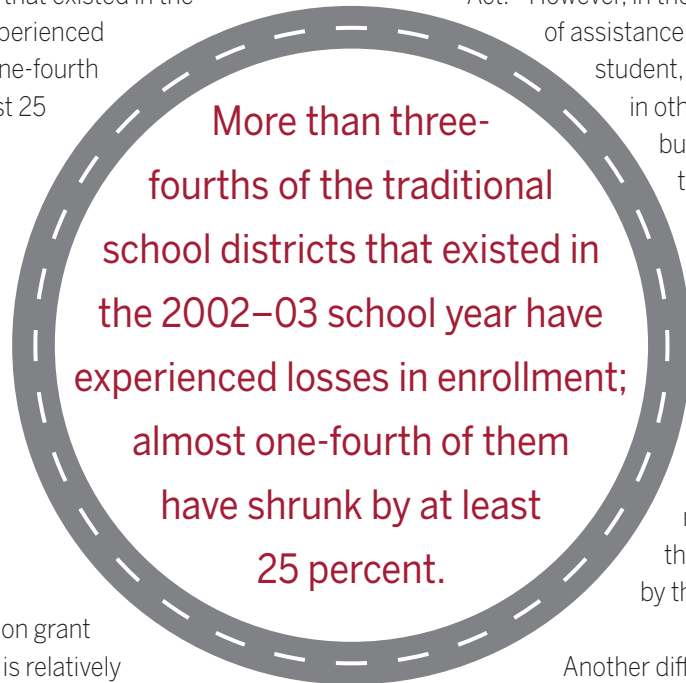
As cogently presented in Citizens Research Council (CRC) (2015), declining enrollment is a significant problem for districts because the foundation grant that is lost exceeds the marginal cost of educating one student. In other words, a loss of enrollment typically decreases costs only slightly, whereas the forfeited foundation grant revenue from losing a student is relatively substantial. If a few students leave a district, they will most likely come from several different classroom or schools. Class sizes may be slightly smaller, but the district is likely to have the same number of classrooms and schools, and, of course, the same number of teachers and building administrators. If there are any cost savings, they would

come from a reduction in materials and possibly from less time spent with individual students. In short, the costs in producing K–12 education are “lumpy.”

Average expenditures per student may also vary substantially because of the mix of students in the district. Students from poverty backgrounds often require smaller class sizes, mentors, more time on task, or other costly interventions in order to succeed. Michigan authorizes additional spending to supplement the foundation grant for at-risk students under section 31a of the State School Aid

Act.¹² However, in the current fiscal year, the level of assistance is around \$600 per eligible student, much less than supplements in other states. (The executive budget that has been presented to the Michigan legislature increases this categorical by about \$180 per eligible student for the next fiscal year.) English language learners also require costly interventions relative to other students in order to succeed. If these students are not eligible for at-risk funding, then these costs must be borne by the district.

Another differential is the cost of delivering instruction by grade level. Best practice for early elementary grades calls for smaller class sizes, which imply more teachers and thus higher costs per student, holding other things equal. Furthermore, some subjects in the secondary grades — for instance, arts, sciences (lab courses), or career and technical education — may require



More than three-fourths of the traditional school districts that existed in the 2002–03 school year have experienced losses in enrollment; almost one-fourth of them have shrunk by at least 25 percent.

¹²“At-risk” students, according to Michigan, are students who have low achievement on state or local assessments in core subject areas; do not meet proficiency standards in reading by the end of 3rd grade; do not meet career or college readiness at the end of 12th grade; are victims of child abuse or neglect; are pregnant teenagers or teenage parents; have a family history of school failure, incarceration or substance abuse; are pupils in a priority or priority successor school; or at least two out of the following seven criteria: 1) eligible for free breakfast, lunch, or milk; 2) excessively absent; 3) homeless; 4) migrant; 5) English language learner; 6) immigrant within last three years; or 7) did not complete high school in four years.

materials and equipment, which make them more expensive on a per-student basis. Thus, districts with disproportionately greater enrollment in early elementary grades or in high school grades will have higher per-student costs.

Other important differentials in cost that vary across districts are regional cost/price differentials and the amount of transportation provided by districts. Edgar Olsen, of the University of Virginia, has constructed a data series that provides cost of living estimates for urban areas in the U.S.¹³ To give a sense of the variation in Michigan, we use the estimates from Olsen's website¹⁴ for Ann Arbor, Benton Harbor, Detroit, Flint, Grand Rapids, and Kalamazoo. Using Kalamazoo as a baseline with an index of 100, the 2012 CPI estimates for Ann Arbor, Benton Harbor, Detroit, Flint, and Grand Rapids would be 108.1, 99.5, 102.9, 97.4, and 105.8, respectively. Just using these data for cities, we find a cost of living differential of 11 percent between Flint and Ann Arbor — two cities that are relatively close to each other.¹⁵

Districts also vary considerably by geographic size, and consequently by transportation costs. Most charter school districts and some urban districts spend nothing on transportation. Many rural or small-city districts spend up to 5 percent of their budget on transportation. Thus, on average,

the latter districts are spending around \$350 of their foundation grants on transportation, whereas some other districts are spending \$0.

In short, Michigan's financing mechanism poorly addresses well-known and well-recognized cost differentials: at-risk students, declining enrollments, instructional cost differences by grade level, regional cost/price variation, and transportation needs.

In addition to its deficiencies with respect to operational costs, the Proposal A financing mechanism does not address at all the costs of capital improvements and infrastructure costs. Traditional districts must use millages and thus depend on property values for major capital or infrastructure improvements. Charter schools do not have the opportunity to ask voters for millages, and so they must use their foundation grants or loans.

Finally, Michigan has always prided itself on its adherence to local control, but Proposal A does not allow localities to exercise their preference for educational quality, except for rarely passed intermediate school district supplements.

¹³ Olsen's series are considered quite reliable and have been used in a number of academic publications that have undergone peer review. See, for example, Olsen (2012) and Olsen and Early (2012).

¹⁴ <http://eoolsen.weebly.com/price-indices.html>, accessed 05/12/2015.

¹⁵ Note that we do not recommend adjusting the foundation grant for regional cost differentials in this study. We are concerned about the extent to which housing cost differentials "drive" the regional cost of living differentials. Housing costs are likely to be low in disadvantaged communities such as Benton Harbor or Detroit, which arguably may need higher foundation grants, and are likely to be high in wealthier communities such as Ann Arbor. Furthermore, communities with high housing costs are also likely to have hold harmless millages.

III: Student Achievement in Michigan

This chapter examines student achievement as a prelude for a detailed examination of finances in the ensuing chapter. If there were no concerns about Michigan’s student achievement, there would be little need to consider altering the finance mechanism at all. However, as this chapter demonstrates, apprehension about student achievement in Michigan is well placed.

The first section of the chapter examines trends in student academic achievement in Michigan relative to the national average. Using National Assessment of Educational Progress (NAEP) data, which are available for all states, and statistics on high school graduation and dropout rates, the picture drawn of Michigan is one of decline relative to the nation as a whole. The next section of the chapter turns to an analysis of achievement by Michigan’s vulnerable students, identified in this study as qualifying for the federal school lunch program.¹⁶ In this section, we analyze the student achievement of low-income and non-low-income students in Michigan and in all other states. We identify seven exemplary states that we use as “benchmarks” for Michigan. The last section of the chapter identifies the detrimental effects on student achievement for both low-income and non-low-income students of attending schools in districts with high percentages of students eligible for the free lunch program.

A. Michigan’s Academic Performance over Time

NAEP, also known as the nation’s report card, is the only nationally representative assessment of student

achievement that can be used to compare states. NAEP assesses 4th, 8th, and 12th graders in different subjects at different frequencies. Assessments of mathematics and reading are given most often, generally biennially.

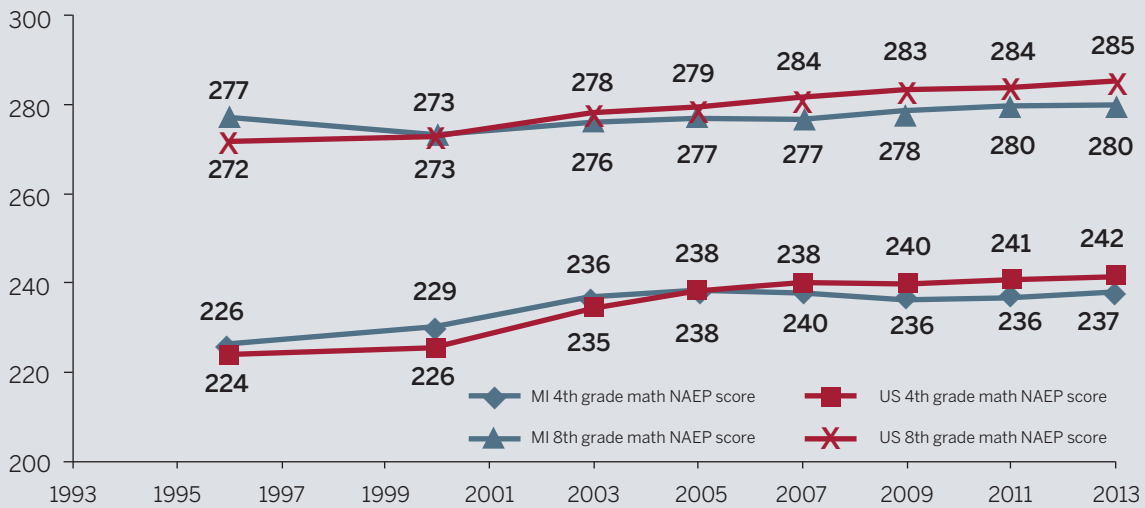
Figure 3-1 shows the trend over the past two decades in NAEP math score results for Michigan and for the U.S. as a whole for 4th and 8th graders. The figure shows the mean scale score results for both grades on a common scale. Before 2000, the average test scores for both grades in Michigan exceed that of the U.S. average. After 2000, the pattern reverses — the U.S. average scores exceed the Michigan average scores, and the differences slowly increase.

Figure 3-2 shows the NAEP results for reading. In this case, the 8th grade reading results are available for Michigan only since 2002. With the exception of the 2013 4th grade means, the averages for the U.S. and for Michigan are much closer to each other than the math assessment means. However, it is worth noting that again the U.S. means are greater than or equal to the Michigan means continuously for years since 2005.

Besides test scores, two other metrics related to student achievement are the high school completion rate and the high school dropout rate. Measures of these rates can be found in the Common Core Data system of the National Center for Education Statistics (NCES). The event dropout rate is defined as the percentage of high school students who left high school between the beginning of one school year and the beginning of the next without earning a high

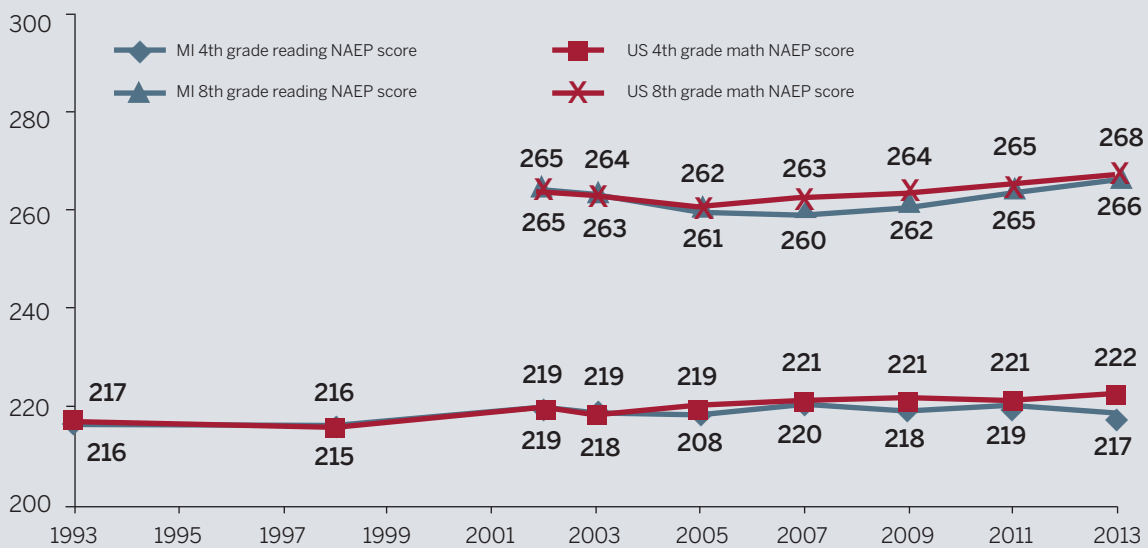
¹⁶The National School Lunch Program is a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions. It provides nutritionally balanced, low-cost, or free lunches to children each school day. The program was established under the National School Lunch Act, signed by President Harry Truman in 1946. Students whose families earn less than 130 percent of the federal poverty level are eligible for free lunches, and those from families with incomes greater than 130 percent and less than 185 percent qualify for reduced price lunches. The current federal poverty guidelines place a family of four earning \$31,525 at 130 percent of the poverty level and a family of four earning \$44,823 at 185 percent of the poverty level. For those in Alaska and Hawaii, the income levels are slightly higher.

Figure 3-1. Michigan and U.S. Math Scores on NAEP, by Year



SOURCE: National Assessment of Educational Progress.

Figure 3-2. Michigan and U.S. Reading Scores on NAEP, by Year



SOURCE: National Assessment of Educational Progress.

school diploma or an alternative credential such as a GED.¹⁷ The average freshman graduation rate in an academic year is calculated as the number of high school diplomas awarded during that year divided by the arithmetic average of the 8th, 9th, and 10th grade enrollments in four, three, and two years prior to the academic year, respectively.

Table 3-1 shows the event dropout rate and the average freshman graduation rate for public high school students in both Michigan and the U.S. For 7 of the 10 years shown in Table 3-1, the event dropout rates are higher for Michigan than for the national average, and the graduation rates for

increased as much as the national average, leading to a wider gap in graduation rates between Michigan and the national average.

B. Achievement of Vulnerable, Low-Income Students

As Michigan traverses the road toward K–12 excellence, the education and achievement of its most vulnerable students must be addressed. These children are from low-income families with fewer resources at home than more affluent families to help their children succeed in school. In this study,

Table 3-1. Michigan and U.S. Dropout and Graduation Rates, by Year

Academic Year	Event Dropout Rate			Average Freshman Graduation Rate		
	Michigan	U.S.	Gap	Michigan	U.S.	Gap
2002–03	4.5	3.9	+0.6	74.0	73.9	+0.1
2003–04	4.6	4.1	+0.5	72.5	75.0	-2.5
2004–05	3.9	3.9	0.0	73.0	74.7	-1.7
2005–06	3.5	3.9	-0.4	72.2	73.2	-1.0
2006–07	7.4	4.4	+3.0	77.0	73.9	+3.1
2007–08	6.2	4.1	+2.1	76.3	74.9	+2.4
2008–09	3.8	4.1	-0.3	75.3	75.5	-0.2
2009–10	4.3	3.4	+1.0	75.9	78.2	-2.3
2010–11	7.2	3.3	+3.9	75.0	80.0	-5.0
2011–12	6.9	3.3	+3.6	77.0	81.0	-4.0

SOURCE: Chapman et al (2011); Stillwell and Sable (2013); Stetser and Stillwell (2014).

Michigan are lower than the national average. The average freshman graduation rates for Michigan are close to the U.S. average over this time period, but they have lagged considerably more since the advent of the Great Recession. Michigan’s graduation rates are slightly higher during the last three years than in the first three years but have not

we follow the common practice of identifying these students as those students who qualify for the federal student lunch program. Using a student achievement index developed from the NAEP scores, the data in Table 3-2 indicate that Michigan is modestly below the U.S. average in test scores for both low-income and non-low-income students. The entries in the

¹⁷The event dropout rate is not an ideal measure of students who leave high school without a credential, as it will count as dropouts students who transfer to another public school district, private school, or state- or district-approved alternative education program; students with a temporary absence due to suspension or school-approved education program; or deceased students. Nonetheless, it is straightforward to calculate for most districts and is readily historically available.

Table 3-2. Michigan vs. U.S. Test Score Indices: 2013 Levels and 2003–13 Changes

	2013 Test Score Index		2003–13 Difference	
	Low-Income Students	Non-Low-Income Students	Low-Income Students	Non-Low-Income Students
Michigan	237.3	262.9	6.0	5.2
United States	240.3	266.3	8.0	8.5

NOTE: Test score index is the simple average of scale scores on the National Assessment of Education Progress for 4th grade and 8th grade reading and math. The 2003–13 difference is the change from 2003 to 2013 in this test score index.

SOURCE: National Assessment of Educational Progress (NAEP).

table correspond to an index that combines NAEP math and reading test score results for grades 4 and 8. In 2013, there is a 3.0 point gap for low-income students and 3.4 point gap for non-low-income students between Michigan and the U.S. state average. The change in this index between the years 2003 and 2013 for Michigan trailed the change in the national average by 2.0 points for low-income students and 3.3 points for non-low-income students. The fact that the changes in Michigan are positive, but have lagged behind the changes for the U.S. state average, implies that Michigan’s academic achievement as measured by these tests has increased over the last decade, but at a slower rate than the U.S. average for both low-income and non-low-income students.¹⁸

One way to understand the significance of the differences in student achievement between students from low-income families and those who are not is to estimate the effect on future earnings. The test score gap for low-income students in Michigan or in the U.S. as a whole shown in Table 3-2 suggests that the typical low-income student would have future earnings that are 18 percent lower than non-low-income students, a differential that becomes quite large over an entire career. The test score gaps of 25.6 points

for Michigan and 26.0 points for the U.S. are around three-quarters of a standard deviation. In percentile terms, low-income students in Michigan (U.S.) are at the 31.4 percentile (34.5 percentile), and non-low-income students are at the 59.8 percentile (63.5 percentile). Drawing upon Chetty et al.’s (2011) findings that a 1 percentile change in test scores at grades 4 and 8 predicts adult earnings differentials of 0.642 percent at the overall adult earnings mean, the 28.4-percentile disadvantage for low-income students in Michigan (29.0 for the U.S.) would be expected to cause an earnings differential of about 18 percent ($28.4 \times 0.642 \approx 18$). Since the overall expected earnings differential between children from low-income families and non-low-income families is around 59 percent when evaluated at the overall earnings mean (Bartik 2014), these test score differentials alone can account for about 30 percent ($18 \div 59$) of the overall earnings disadvantage of low-income families.

Comparing individual MEAP test scores within the state of Michigan (rather than state-level NAEP scores) for low-income students and non-low-income students gives similar results. Differences in average reading and math test scores from 3rd through 8th grade between low-income students

¹⁸ In this and ensuing sections, we focus on the gaps in educational outcomes (as proxied by test scores) between low-income and non-low-income students. The definition of low-income is eligibility for free or reduced price lunch. These gaps are pervasive and economically significant, as documented below.

¹⁹ The average scale score differential between low-income and non-low-income students over reading and math MEAP tests in grades 3 through 8 in 2013 was 20.25 points. As the MEAP is designed to have a standard deviation of 25 scale points, the differential corresponds to 0.81 standard deviations. In percentile terms, the average low-income student scores at the 33.6 percentile of the overall test score distribution, while the average non-low-income student scores at the 65.0 percentile. This 31.4 percentile differential would be predicted, based on Chetty et al.’s (2011) results, to yield a 20 percent earnings differential, where the percentage is relative to the overall mean of earnings.

Table 3-3. Ranking of States on NAEP Academic Performance Index

Rank	State	Index of State Academic Performance, 2013 Levels and 2003–13 Changes
1	New Jersey	1.29
2	Massachusetts	1.24
3	Maryland	1.21
4	Florida	0.86
5	Pennsylvania	0.86
6	New Hampshire	0.83
7	Indiana	0.80
8	Georgia	0.58
9	Vermont	0.54
10	Washington	0.46
11	Colorado	0.43
12	District of Columbia	0.43
13	Minnesota	0.40
14	Tennessee	0.35
15	Hawaii	0.34
16	Wyoming	0.25
17	Nevada	0.24
18	North Carolina	0.19
19	Texas	0.19
20	Maine	0.15
21	Rhode Island	0.11
22	Ohio	0.09
23	Wisconsin	0.08
24	Kentucky	0.03
25	Delaware	0.02
26	Kansas	0.00
27	Idaho	-0.03
28	Montana	-0.06
29	Arkansas	-0.10
30	Oregon	-0.13
31	Utah	-0.16
32	Nebraska	-0.21
33	Arizona	-0.24
34	California	-0.27
35	Virginia	-0.28
36	Connecticut	-0.33
37	Missouri	-0.34
38	Illinois	-0.36
39	Iowa	-0.45
40	North Dakota	-0.51
41	New York	-0.54
42	New Mexico	-0.55
43	Alabama	-0.61
44	Oklahoma	-0.62
45	Michigan	-0.64
46	Louisiana	-0.84
47	Mississippi	-0.89
48	West Virginia	-1.03
49	South Carolina	-1.06
50	South Dakota	-1.07
51	Alaska	-1.07

NOTE: The index is calculated using four inputs for each state: 1) the simple mean of average test score levels for low-income students in 2013 for 4th graders and 8th graders in reading and math; 2) the same simple mean of average test score levels but for non-low-income students; 3) the simple mean of average test score changes between 2003 and 2013 for low-income students, again for 4th and 8th graders in reading and math; and 4) this same simple mean of average test score changes for non-low-income students. Each of these inputs is expressed in standard deviation units relative to the national mean, where the standard deviation is across the 51 state observations of each input. The index then calculates a weighted average of these four inputs, with a double weight put on the test score levels and trends of low-income students. An equally weighted average yields similar rankings. SOURCE: National Assessment of Educational Progress (NAEP).

Table 3-4. Michigan vs. Leading States' Test Score Indices: 2013 Levels and 2003–13 Changes

	2013 Test Score Index		2003–13 Trends	
	Low-Income Students	Non-Low-Income Students	Low-Income Students	Non-Low-Income Students
Michigan	237.3	262.9	6.0	5.2
New Jersey	245.5	272.3	14.5	10.8
Massachusetts	247.6	277.3	10.7	12.4
Maryland	243.5	270.3	15.5	13.5
Florida	244.8	267.0	12.8	10.2
Pennsylvania	243.5	269.0	13.0	10.0
New Hampshire	248.3	269.0	8.8	8.5
Indiana	246.5	267.5	10.5	9.0

NOTE: Same sources as Table 3-2.

and non-low-income students predict an earnings gap of about 20 percent.¹⁹

To provide a more comprehensive index of student achievement across states, we developed an index based on the four tests in 2013 and the change in test scores between 2003 and 2013 for both low-income and non-low-income students. With this index, New Jersey and Massachusetts are clearly at the top of the list of states, as shown in Table 3-3, joined by Maryland. After that, there is a large gap in the index between Maryland and Florida, but indices for the next four states — Florida, Pennsylvania, New Hampshire, and Indiana — are close in value.

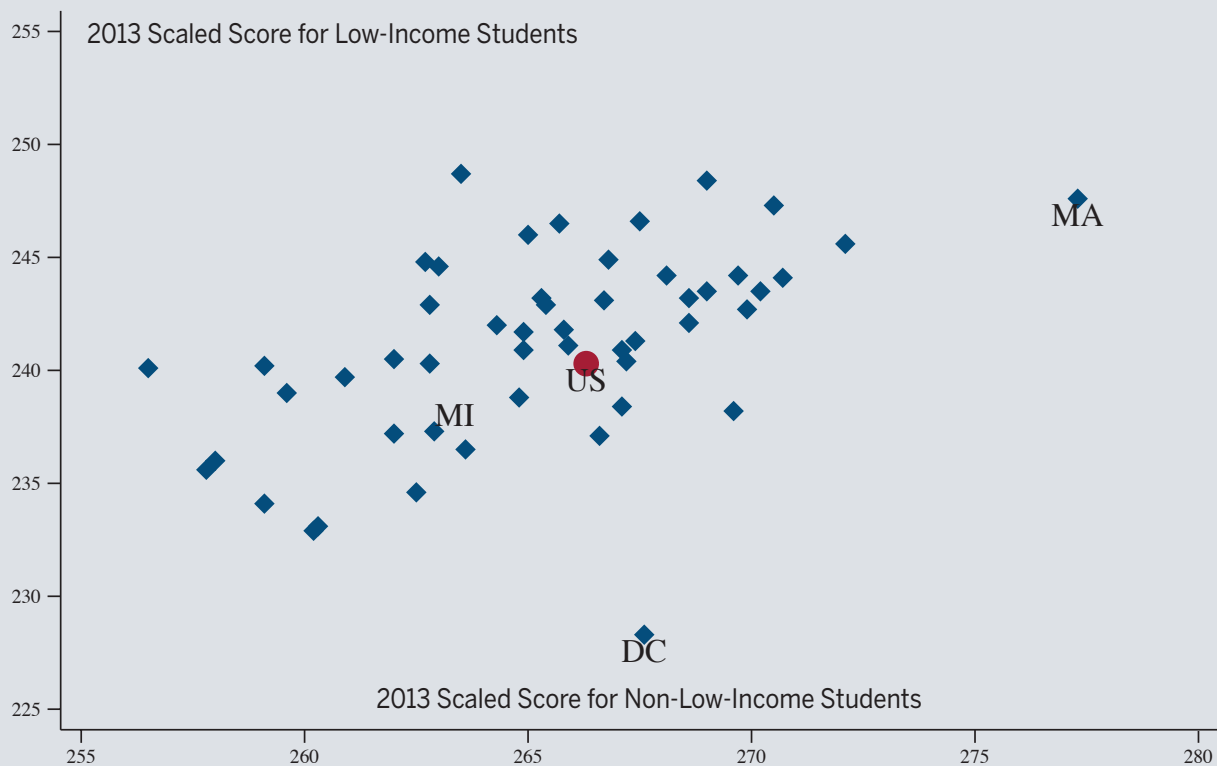
Michigan ranks 45th out of the 50 states and District of Columbia. This low ranking is attributable to Michigan scoring below almost all of the other states in test score levels or in test score changes, or — compared with leading states — both. The seven top ranking states in the table, our “exemplary” benchmark states, have values of our constructed index that are well above all of the other states. Table 3-4 shows the same test score levels and changes for low-income and non-low-income students that are displayed in Table 3-2 for Michigan and for the U.S. average, but in this case the table

shows data for Michigan and for those seven top ranking states. Note that Michigan is well behind these seven states in each of the four columns of the table.

How do Michigan's test score differentials across income groups compare to other states? Almost every state has large test score differentials between low-income students and non-low-income students. In the NAEP score index we have constructed, every state has scores for low-income students that average at least 16 percentiles lower than the scores for non-low-income students, and 40 of the 50 states (plus the District of Columbia) have test score differentials of at least 23 percentiles. Michigan's test score differential of 28.4 percentiles is slightly below the U.S. average differential of 29 percentiles.

States differ greatly in their overall academic performance, but if a state does better than the average state, it tends to do uniformly better for both low-income students and non-low-income students, and if it does worse than the average state, it does worse for both income groups. Figure 3-3 shows the relationship between the average NAEP test score index for low-income students and non-low-income students by state.

Figure 3-3. Comparison of Non-Low-Income and Low-Income Test Score Levels



NOTE: Each point represents a state (including DC), and the red circle represents the U.S. average. The horizontal axis is the average NAEP 2013 reading and math scores for 4th and 8th grade for non-low-income students; the vertical axis is the same for low-income students. Michigan, Massachusetts, DC, and the U.S. average are identified as data points. SOURCE: National Assessment of Educational Progress (NAEP).

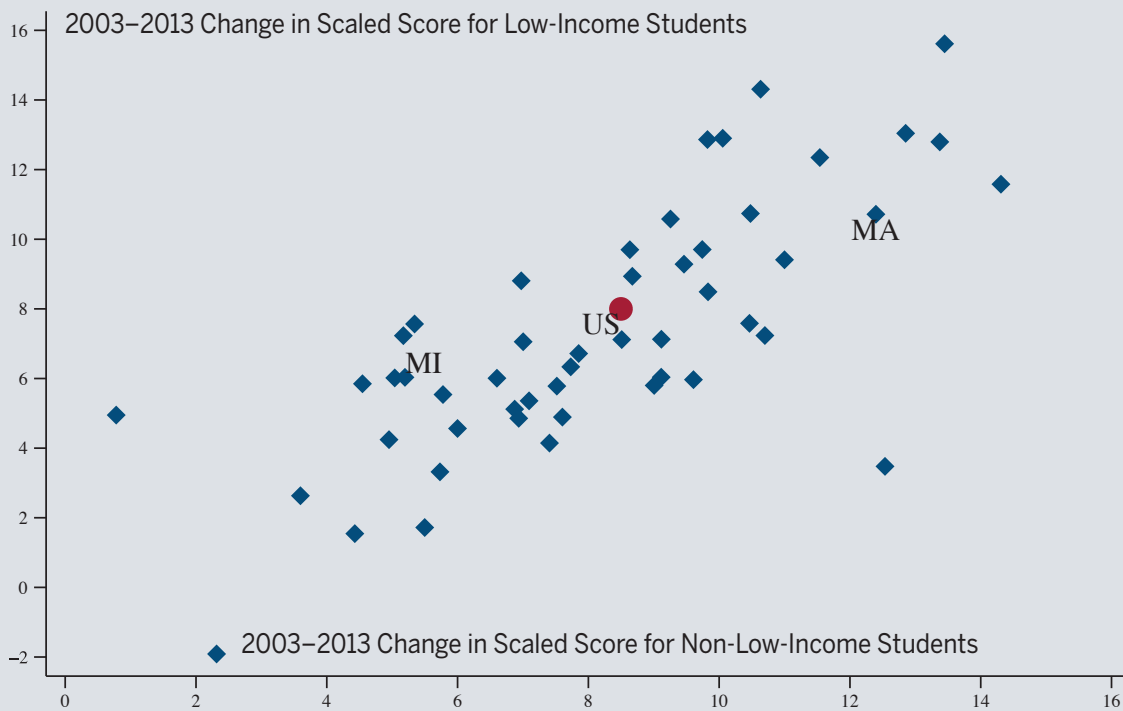
With the exception of one outlier, the District of Columbia, which has unusually high scores for non-low-income students relative to low-income students, the relationship is quite strong, with a correlation of 0.62. Even including the District of Columbia, the correlation between this NAEP test score index for low-income and non-low-income students is 0.52 and highly statistically significant.

However, Figure 3-3 shows that Michigan falls below the national average of test scores for both low-income students and non-low-income students. It is accompanied by 10 other states that are in the lower left-hand quadrant of the graph. Nearly 20 states fall into the upper right-hand quadrant of the graph, which indicates that their test scores are higher than the national average for both income groups of students.

Massachusetts, for example, is clearly above the national average for both student groups, particularly for non-low-income students.

Test score changes are also highly correlated across income groups. Across all states, the correlation in NAEP test score changes from 2003 to 2013 between low-income students and non-low-income students is 0.68 and highly statistically significant. Excluding DC, which once again is an outlier in having much stronger gains for non-low-income students, the correlation is 0.75. As Figure 3-4 on the next page shows, states tend to have either strong gains for both low-income and non-low-income students, or weak gains for both groups. Unfortunately, Michigan exhibits below average gains for both student income groups.

Figure 3-4. Comparison of Non-Low-Income and Low-Income Test Score Changes



NOTE: Each point represents a state, and the red circle represents the U.S. average. The horizontal axis is the average gain in NAEP test score for reading and math for 4th and 8th grade non-low-income students over 2003-13; the vertical axis is the same for low-income students. Michigan, Massachusetts, and the U.S. average are identified as data points. The District of Columbia is an extreme outlier and is not shown; it experienced a gain of 35.7 points for non-low-income students and a gain of 15.9 points for low-income students. SOURCE: National Assessment of Educational Progress (NAEP).

Thus, some states do much better than Michigan in overall performance for both low-income students and non-low-income students. But in nearly all states, the levels and gains of academic performance of both income groups are closely linked, so states do not differ dramatically in test score gaps or in progress in closing test score gaps.

These results suggest that, regarding the issue of achievement gaps, the proverbial glass is half full, or maybe even three-fourths full. As a rule, states are not achieving much closure in the gap between low-income and non-low-income students, but on the other hand, they are raising the overall achievement of both groups of students. If we were to portray the distributions of test scores for low-income and

non-low-income students, we would likely see bell-shaped curves, with much of the low-income distribution to the left of the non-low-income distribution. The fact that the test score levels and changes are correlated across the two groups suggests that both bell curves are moving to the right. Unfortunately, Michigan's progress for both these groups is behind the national average, and even more behind the leading states.

C. Interaction of District Level Poverty with Family Poverty

Studies show that students' academic achievements are affected not only by their own income status, but also by the characteristics of their peers. We hypothesized an interaction effect between an individual student's income status and

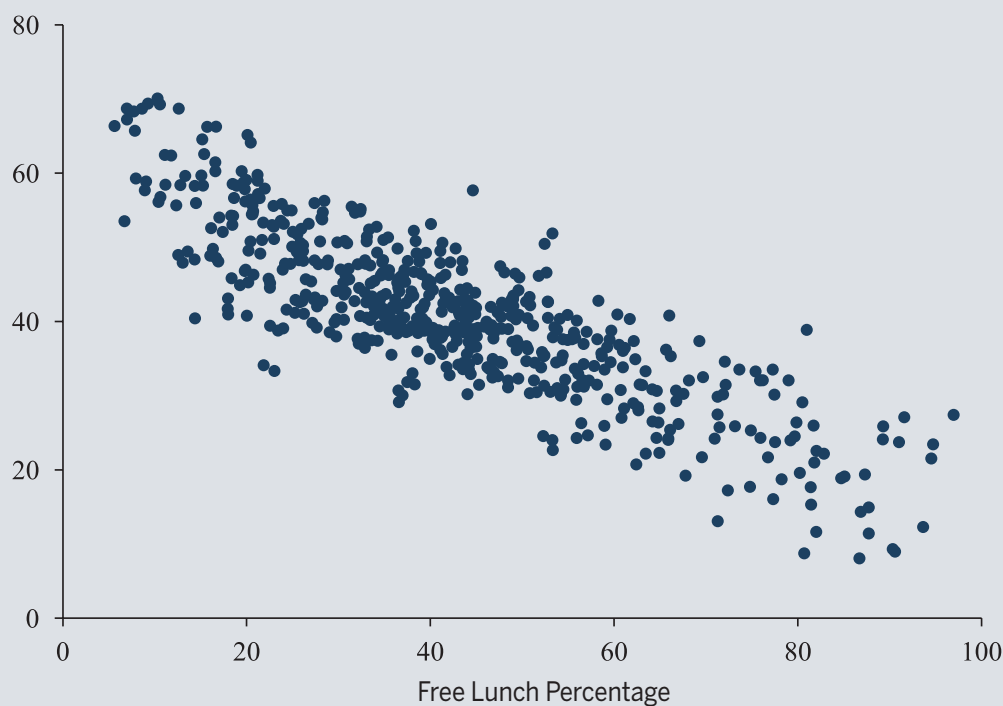
the percentage of low-income students in the district that the student attends. Specifically, we hypothesized that students who attend a district with a high concentration of low-income students are at a disadvantage compared to low-income students in districts with less concentration of poverty. An examination of Michigan's K-12 school districts shows strong evidence of this relationship.

Figure 3-5 shows the negative relationship for Michigan school districts between the concentration of poverty in a district, measured by the percentage of students eligible for the free lunch program,²⁰ and a composite of all MEAP test

results administered by the district. For each one percentage point increase in percentage of students on the free lunch program, the composite index of the percentage of students who are proficient on the tests declines by a half percentage point, even controlling for total revenue per student.²¹

The same negative relationship is found when looking at the composite test results separately for students from low-income families and non-low-income families. As shown in Figure 3-6, test passing rates fall for both groups

Figure 3-5. Relationship between Student Test Results and Concentration of Poverty in Michigan School Districts



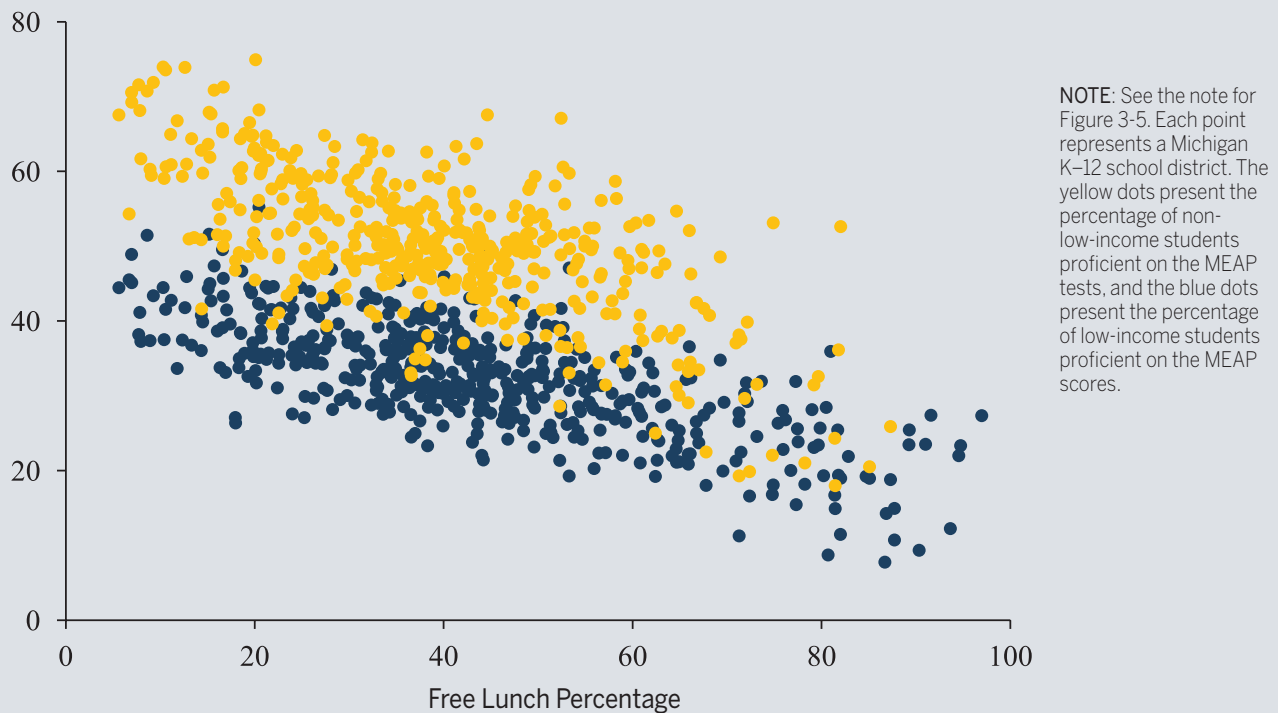
NOTE: Each point represents a Michigan K-12 school district. Student test results are a weighted average of the percentage of students proficient in MEAP tests taken in 2010-2011 by students in a K-12 school district in Michigan. Tests include reading, math, writing, and science. The concentration of poverty is measured as the percentage of students in a district eligible for the free lunch program.

SOURCE: National Assessment of Educational Progress (NAEP).

²⁰In the analyses in this section of the report, we examine students eligible for free lunch, i.e., family income less than 130 percent of the poverty line, and do not include students eligible for reduced price lunch.

²¹ The coefficient associated with the percentage on free lunch is -0.51 with a t-statistic of -34.8 and the coefficient associated with total revenue per student is 0.00029 with a t-statistic of 2.12 .

Figure 3-6. Relationship between Student Test Results and the Concentration of Poverty in Michigan K-12 School Districts for Low-Income Students and Non-Low-Income Students



as the percentage on the free lunch program increases. When student achievement is measured as the percentage of students proficient on the tests, the percentage falls faster for those not on the free lunch program than for those who are. When the scale score is used (not shown in the figures), only the low-income students are negatively affected by concentrated poverty in the districts they attend. The scale scores for non-low-income families do not vary with the percentage on the free lunch program. Therefore, the achievement gap between students in the two income

groups decreases with the percentage on the free lunch program when the percentage proficient is used, and the gap increases when the scale scores are used.

This feedback loop, or interaction, between the academic achievement of low-income students and the concentration of poverty in a district amplifies the point that districts are unique and face different challenges. It suggests that a “one size fits all” funding scheme, even with the “one size fits all” section 31a at-risk categorical, will be far less adequate in a high-poverty district than in a district that has a small share

IV: K–12 Education Financing

The previous chapter provides evidence that Michigan’s student achievement has suffered relative to the nation and especially relative to some exemplary states. This chapter will explore how resources affect student achievement and compare Michigan’s financing of education to other states.

A. State Revenues per Pupil

This first section of the chapter looks at the level of funding for K–12 education, by state. In order to meaningfully compare states that vary greatly in the number of students, the revenue data presented here is normalized on a per-pupil basis.

In 1992, prior to Proposal A implementation, Michigan was a leading state in terms of resource support for education. It ranked 10th in total revenue per student and, at the time,

the majority of funds came from local sources. In 1993, 63.2 percent of the total state revenue for K–12 schools came from local sources, primarily the property tax, whereas 30.6 percent came from the state and 6.2 percent came from federal sources. Contrast these statistics with those from 2011, in which 31.0 percent was derived from local sources and 55.1 percent came from the state, with federal sources contributing the rest. (The 31.0 percent from local sources is somewhat misleading, however, because the state controls the rates of property taxes and the tax base in most districts is limited to non-homestead property.)

Michigan’s rank among states in this statistic has dropped considerably. It was a high-support state prior to Proposal A, and even after Proposal A went into effect it ranked as high as 6th. However, the last column in Table 4-1 documents the decline in the state’s ranking. As the table shows, prior to the

Table 4-1. Total Per-Pupil Funding, Michigan and Nationwide State Average, 1994–2011

Year	Nationwide State Average	Percentage Change	Michigan	Percentage Change	Michigan Rank
1993–94	\$5,923		\$6,962		9
1994–95	6,162	4.04%	7,385	6.08%	8
1995–96	6,363	3.25	7,736	4.75	7
1996–97	6,622	4.07	7,971	3.02	7
1997–98	6,965	5.18	8,415	5.58	6
1998–99	7,393	6.15	8,533	1.39	9
1999–2000	7,852	6.21	8,916	4.49	11
2000–01	8,415	7.17	9,507	6.63	10
2001–02	8,800	4.58	10,131	6.56	11
2002–03	9,110	3.52	10,058	–0.72	14
2003–04	9,575	5.10	10,260	2.01	16
2004–05	10,138	5.88	10,489	2.23	19
2005–06	10,745	5.99	10,893	3.85	19
2006–07	11,417	6.25	11,369	4.37	20
2007–08	12,114	6.10	11,591	1.95	24
2008–09	12,472	2.96	11,799	1.79	25
2009–10	12,690	1.75	11,765	–0.29	26
2010–11	12,752	0.49	12,266	4.26	23

NOTE: Dollar figures are nominal.

2006–07 school year, the total per-pupil funding in Michigan exceeded the state average nationwide; but since that year, the state’s level of funding has been less than the nationwide average. The entries in the table are totals of state, local, and federal funding sources. The relative decline in Michigan might be characterized as precipitous. In the eight years between 1993–94 and 2001–02, per-pupil funding in Michigan exceeded the national average by more than \$1,000 per student. Over the next four years, the difference shrank considerably, becoming negative in 2006–07.

The switch from local to state funding was more dramatic in Michigan than in all but one other state. As shown in Figure 4-1, the shift by states from local to state funding or state to local funding was fairly balanced during the period described above. Eighteen states shifted toward more state

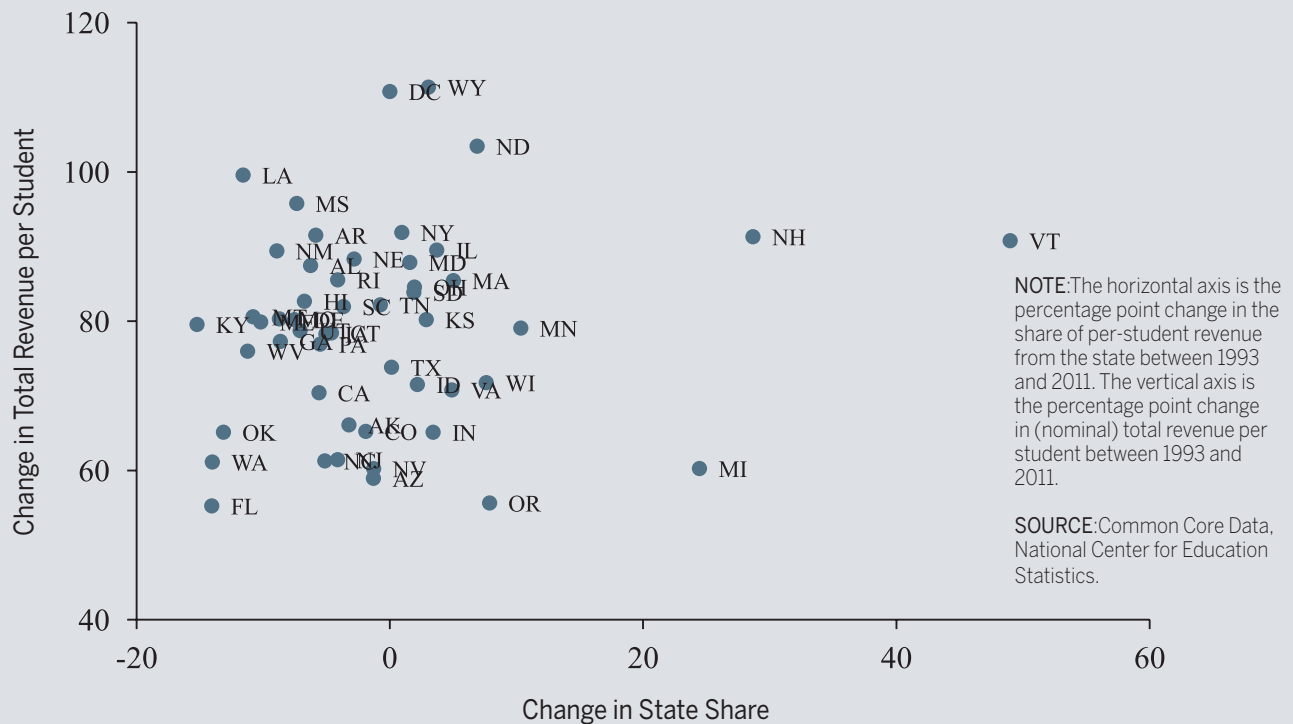
funding, whereas 21 states shifted toward more local funding. However, for most of the states the shifts were relatively small, with three exceptions, of which Michigan was one. For Michigan, the share of local funding declined by 33 percentage points; New Hampshire’s share of local revenue declined by the same amount. Vermont’s share of local funding fell from 62.1 percent in 1993 to 7.6 percent in 2011, a decline of 55 percentage points. Concomitantly, the state share of funding in Vermont rose from 32.7 percent to 81.7 percent.

According to Downes (2004), who conducted a careful analysis of Vermont’s funding mechanism and the process by which the legislature arrived at a new method, the subsequent legislation was “as much about property tax relief as it was about school finance reform” (p. 286). Cullen

Figure 4-1. Percentage Change in Local and State Shares of Per Student Financing, 1993–2011, by State



Figure 4-2. Percentage Change in State Share and Total Revenue Per Student Financing, 1993–2011, by State



and Loeb (2004) suggest that Michigan’s education financing reform in 1994 was similarly motivated by the desire for property tax relief, as Michigan’s property tax burden at the time was the seventh highest among the states (U.S. Census Bureau 1992).

Vermont’s radical change in the way it financed K–12 education came about from a State Supreme Court ruling in 1997. In response to plaintiffs who claimed that property-poor school districts in the state could not afford the same educational opportunities to students, the Supreme Court stated that the existing system deprived “children of an equal educational opportunity in violation of the Vermont

Constitution” (Brigham v. State 1997, 166 Vt. at 249).²² The Supreme Court left it to the state legislature to find a way to comply with its ruling. Vermont’s approach to finance reform was to combine elements of foundation and power equalization mechanisms. Vermont legislation established a statewide property tax, and a portion of the foundation aid was funded through that tax. The power equalization part of the funding mechanism ensured that localities with the same nominal tax rates would have the same levels of education spending.

Does the share of funding from state and local sources make a difference in the overall level of revenue per student? Most

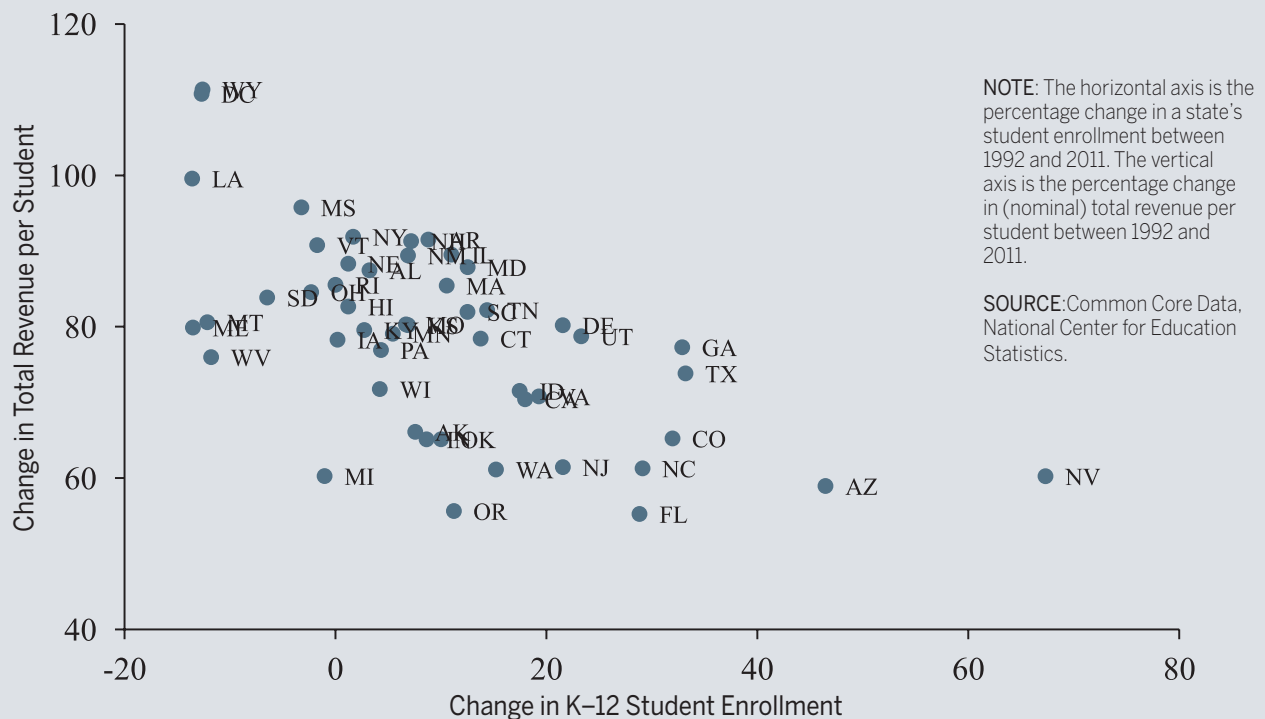
²²Cited in Downes (2004).

states have made some changes in the share of revenue from local and state sources to fund K–12 education. Some states have changed their funding mechanisms with the purpose of reducing differences in per-pupil revenue across school districts in their state and to increase the overall level of funding, with a minimum increase in the tax burden on local taxpayers. We examined whether there was a significant difference in funding per student in states that made these changes. As shown in Figure 4-2 on the previous page, there is no obvious relationship between the change in the share of state funding (expressed in percentage point terms) and the change in per-student total revenue at the state level. What is noticeable is that Michigan’s percentage increase in per-student total revenue is among the lowest during this time. Only Oregon, Arizona, and Florida had percentage increases

smaller than Michigan’s (nominal) 60 percent gain between 1993 and 2011. The average increase among the states and the District of Columbia during that time was 79 percent, with a minimum of 55 percent (Florida) and a maximum of 111 percent (Wyoming).

An interesting relationship holds between the growth in total revenue per student and the growth in student enrollment during this period. As shown in Figure 4-3, those states (and the District of Columbia) with higher enrollment growth experienced lower per-student total revenue growth. Michigan’s K–12 student enrollment fell one percentage point between 1993 and 2011. However, the 12 other states with declines in enrollment outpaced Michigan with a greater increase in total revenue per student.

Figure 4-3. Percentage Change in per Student Total Revenue and in K–12 Student Enrollment, 1993–2011, by State

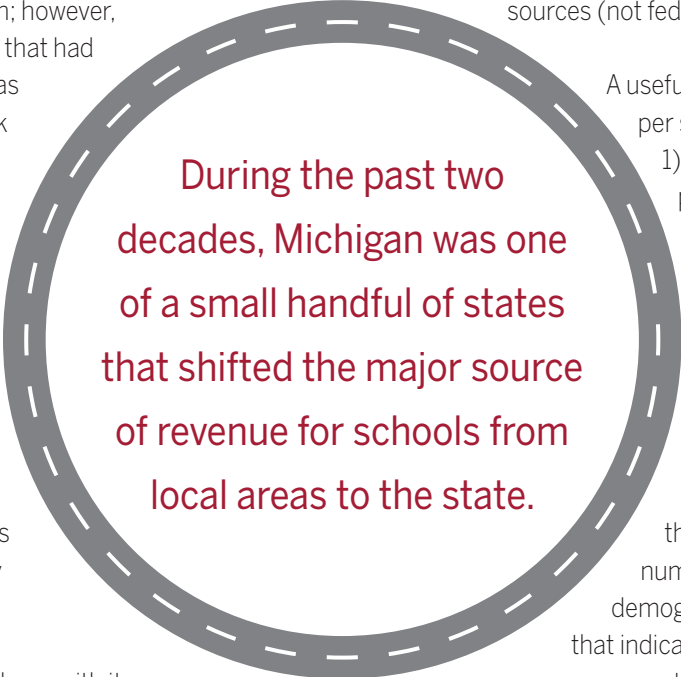


During the past two decades, Michigan was one of a small handful of states that shifted the major source of revenue for schools from local areas to the state. Of that small sample, Michigan had, by far, the smallest growth in per-pupil revenue. Furthermore, over that time frame, most states experienced enrollment growth; however, Michigan did not. Of the states that had enrollment losses, Michigan was again at the bottom of the pack in terms of growth in per-pupil revenue. Clearly, over this time frame, Michigan was not able to hold its own in terms of resource support (revenue) per student. Recognizing that the level of school aid is determined by the governor and legislature, we nevertheless believe that Michigan's lagging support was mainly a matter of affordability and not a political choice. The political decision makers were hamstrung by Michigan's problems with its fiscal capacity, as will be described in the next section.

B. Michigan's Fiscal Capacity and Types of Expenditure

The resources that any state has available to fund K-12 education depend upon two key factors: the size of the tax base and the rate at which the state taxes that base. As described in the previous section, the tax base for Michigan changed dramatically with Proposal A, moving from heavy reliance on local taxes to a higher percentage of state funding. Nonetheless, the tax base is still a combination of local property and items subject to a state sales tax. Therefore, in order to compare the resources available and the tax effort expended across states for K-12 education, two measures are used. The first is gross state product (GSP), which is the broadest measure of the capacity of a state's economy to support K-12 education. Although GSP does not capture the stock of capital, of which property could

be considered a component, for property to be valuable and contribute to the tax base it must be used for productive purposes, which are captured in GSP. The second measure is the revenue generated from local and state sources (not federal) to fund K-12 education.



During the past two decades, Michigan was one of a small handful of states that shifted the major source of revenue for schools from local areas to the state.

A useful tautology is to divide revenue per student into three components:

1) revenue per GSP, 2) GSP per capita, and 3) total state population per pupil. Revenue per GSP is a measure of effort relative to capacity — how much of the state's GSP is going toward K-12 education. GSP per capita is considered the revenue capacity of a state. The ratio of the total state population to the number of students is essentially a demographic characteristic of a state that indicates how broadly educational

resources must be spent. Lower values of this ratio — equivalent to higher numbers of students per person in a state — mean that a state's population must educate relatively more students, holding constant the state's fiscal capacity (GSP per capita). Multiplying together the three components yields revenue per pupil. This tautology offers a convenient way to examine which of the three may explain differences across states in the funding of K-12 education on a per-pupil basis.

Education Week (2015) graded all 50 states plus the District of Columbia on school finance issues. This analysis used two fiscal components. First, for fiscal capacity, it relies on real GSP per capita — the same measure for fiscal capacity as described above. The second measure is real state and local revenue per student. Dividing real state and local revenue per student by real GSP per capita yields the measure of fiscal effort times population per student — the third component listed in the previous paragraph.

Table 4-2. Gross State Product, State and Local Educational Revenue, and Indices of Effort and Capacity in 2012, by State

State	Real GSP per Capita (1)	Real (S&L) Revenue per Student (2)	Revenue Effort Index (3)	Revenue Capacity Index (4)	Index of Revenue Effort Relative to Capacity (5)
Alabama	\$44,617	\$9,672	87.2	86.8	100.5%
Alaska	76,135	14,504	130.7	148.1	88.3
Arizona	42,233	7,373	66.4	82.1	80.9
Arkansas	46,060	10,764	97.0	89.6	108.3
California	49,494	8,250	74.3	96.3	77.2
Colorado	52,850	9,181	82.7	102.8	80.5
Connecticut	61,848	16,372	147.5	120.3	122.7
Delaware	64,646	13,443	121.1	125.7	96.4
DC	149,678	22,626	203.9	291.1	70.0
Florida	40,292	8,019	72.3	78.4	92.2
Georgia	48,028	10,220	92.1	93.4	98.6
Hawaii	44,437	10,350	93.3	86.4	107.9
Idaho	38,987	6,849	61.7	75.8	81.4
Illinois	54,363	12,823	115.6	105.7	109.3
Indiana	51,522	12,045	108.5	100.2	108.3
Iowa	56,919	12,449	112.2	110.7	101.4
Kansas	53,560	11,916	107.4	104.2	103.1
Kentucky	45,752	10,253	92.4	89.0	103.8
Louisiana	59,763	11,381	102.6	116.2	88.2
Maine	40,743	12,581	113.4	79.2	143.1
Maryland	51,375	13,563	122.2	99.9	122.3
Massachusetts	60,626	14,803	133.4	117.9	113.1
Michigan	44,670	11,779	106.2	86.9	122.2
Minnesota	56,872	12,551	113.1	110.6	102.3
Mississippi	39,376	8,661	78.1	76.6	101.9
Missouri	50,770	11,380	102.6	98.7	103.9
Montana	44,506	10,435	94.0	86.6	108.6
Nebraska	61,646	12,265	110.5	119.9	92.2
Nevada	47,576	8,671	78.1	92.5	84.5
New Hampshire	47,135	13,202	119.0	91.7	129.8
New Jersey	52,280	16,632	149.9	101.7	147.4
New Mexico	45,111	9,586	86.4	87.7	98.5
New York	56,710	18,034	162.5	110.3	147.4
North Carolina	50,640	8,181	73.7	98.5	74.9
North Dakota	78,280	12,973	116.9	152.2	76.8
Ohio	53,268	13,767	124.1	103.6	119.8
Oklahoma	49,987	8,457	76.2	97.2	78.4
Oregon	54,572	9,870	88.9	106.1	83.8
Pennsylvania	49,998	14,975	135.0	97.2	138.8
Rhode Island	49,743	14,675	132.2	96.7	136.7
South Carolina	41,542	10,824	97.5	80.8	120.7
South Dakota	59,533	9,620	86.7	115.8	74.9
Tennessee	47,899	8,491	76.5	93.2	82.1
Texas	58,178	9,342	84.2	113.1	74.4
Utah	48,657	7,062	63.6	94.6	67.3
Vermont	44,997	16,311	147.0	87.5	168.0
Virginia	52,687	10,271	92.6	102.5	90.3
Washington	54,922	10,026	90.4	106.8	84.6
West Virginia	42,406	14,109	127.1	82.5	154.2
Wisconsin	51,146	12,412	111.9	99.5	112.5
Wyoming	75,296	17,467	157.4	146.4	107.5
U.S. Average	\$ 51,419	\$11,097	100	100	100%

NOTE: Column (1) has per-capita GSP from the Bureau of Economic Analysis (BEA) adjusted by state cost of living from the BEA. Column (2) has per-student state and local revenue from U.S. Census Bureau (2014) adjusted by state cost of living. Column (3) is an index of column (2) with the U.S. average at 100; column (4) is an index of column (1) with the U.S. average at 100. Column (5) is column (3) divided by column (4) in percentage terms.

These measures are shown in Table 4-2, with the two measures of GSP per capita and revenue per student expressed as an index and revenue effort expressed as the ratio of revenue per student to GSP per capita. The *Education Week* article ranked Michigan 23rd among the states. One of the criteria used in determining this grade was “percent of taxable resources spent on education (2012).” At 3.8 percent, Michigan was above the national average of 3.4 percent (in fact, Michigan had the 12th highest percentage). The data used to proxy for “taxable resources” in the *Education Week* rankings was GSP. In Table 4-2, we show Michigan’s fiscal capacity using the same data as *Education Week*, except that we have converted the individual state revenue and GSP into real dollars, using a state-level cost adjustment from the Bureau of Economic Analysis.

Michigan is near the bottom quintile of states in GSP per capita at \$44,670 (ranks 41st) and concomitantly in the revenue capacity index at 86.9 percent (this statistic may be interpreted as indicating that Michigan’s GSP per capita is about 13 percent below the national average.). By this measure, Michigan is well below all of its competitor states in the North Central region of the country — Illinois, Indiana, Minnesota, Ohio, and Wisconsin. Despite such a low resource base, Michigan is in the middle of the pack (25th) in per-pupil (state plus local) revenue at \$11,779. Not surprisingly then, Michigan’s index of effort relative to capacity is relatively high (ranked 11th). The bottom line is that, as measured by GSP per capita, Michigan is a relatively poor state, and yet it continues to fund education relatively well.

The importance of a strong economy for financing K–12 education can be illustrated by considering how an increase in GSP per capita might affect state and local revenue per pupil. Consider the effect on state and local revenue per pupil if Michigan’s economy was equal to the national average — \$51,419 per capita, without changing any other factors that affect the generation of revenue, such as overall

fiscal effort. Such an improvement in the state economy — which is not an unreasonable scenario since Michigan’s real per capita GSP around the year 2000 was approximately equal to the national average — would generate an additional 15 percent in revenue from state and local sources, bringing Michigan’s ranking in revenue to 14th position from 25th. State and local revenue per student in this case would be 122 percent of the national average, offering nearly \$2,000 more revenue dollars per student to support education. Obviously, if GSP per capita for Michigan were even higher, so would be the revenue available for education. Unfortunately, in the short run, there is not much that state government can do about the current economy, but in the long run investment in education can be a stimulus in putting the economy on a higher growth path. (See Bauer et al., 2006.)

Another factor that figures heavily in the generation of state and local revenue for K–12 education is fiscal effort. This is defined as state and local revenue as a percentage of GSP and is related to the willingness of state residents to tax their income to support government activities, and then more specifically to direct those funds to education. Table 4-2 shows the fiscal effort as an index pegged to the national average. Michigan’s fiscal effort is 122 percent of the national average, which places it 11th among the states. If the effort were intensified to be more like the fiscal effort of New York and New Jersey, two of the exemplary states identified earlier, state and local revenue per student would grow from \$11,779 to \$14,205, providing nearly \$2,500 more per student. This hike in fiscal effort would place Michigan at 128 percent of the national average.

From a fiscal viewpoint, the state’s role in K–12 education is to provide revenue; districts determine how the revenue gets spent. An important category of expenditure is instructional expenses.²³ The average state share of revenue spent

²³Chakrabarti and Roy (2012) provide justification for why this fiscal statistic is important. Basically, they argue that it is a proxy for school district productivity. They furthermore cite U.S. Department of Education (2009), a communique that explicitly asked school districts to invest Title I dollars in improving instruction, so as to bolster student achievement.

on instruction is a little over 50 percent. Table 4-3 shows the percent of revenue spent on instruction for the years 1993–94 and 2011–12 for the 50 states and DC. There is not a great deal of variation by state; in the latter year of data, the national average is 52.6 percent and the minimum and maximum are 39.3 percent (DC) and 62.6 percent (NY), respectively. However, this seems to be an expenditure category for which Michigan is relatively weak. It ranked 44th in 1993–94 and 40th in 2011–12. Note that benefits for current employees are included in this figure, although pension and health benefits for retired personnel are not. It should also be noted that capital costs for charter schools are included in (non-instructional) operating expenses, which may tend to depress the instructional percent of spending.

We examined several general categories of non-instructional expenditures, which constitute approximately half of the budget. Michigan's expenditures on general district administration and school building administration are relatively low compared to other states (in the bottom one-third of states in both cases). Furthermore, expenditures on operations and maintenance are particularly low in 2011–12, ranking 47th and dropping from 32nd in 1993. On the other hand, Michigan's expenditures on student support services and other support services are relatively high (top fifth of states). Student support services comprise guidance, school health, hearing, and speech specialists. Other support services include business offices and data processing (not instructional IT support). Instructional support services (training, media centers, audio/visual) and professional and technical support services (legal, accounting/auditing, rentals) are in the middle of the pack.

Benefits to employees in Michigan are relatively high. In 1993, the state paid, on average, \$1,244 in benefits per pupil. This was the 9th highest level of benefits among the states, and it ranked 10th in terms of benefits as a share of total expenditures. By 2011, the cost of employee benefits per student had increased to \$2,786,²⁴ which is 15th highest

among the states but 6th in terms of benefits as a share of total expenditures. Note that these benefits are for current employees only and do not include pension or retirement health benefits. When measured as the ratio of employee benefits to total salaries for instructional personnel (teachers and aides), the state ranked third, with a share of 53 percent. Only West Virginia and Alaska ranked higher by this measure. The relatively high costs in Michigan are caused by relatively high salaries that naturally increase the cost of benefits that are tied to salaries including payroll taxes and pension contributions. The latter are inflated by the necessity of covering the unfunded liabilities in the Michigan State Professional Employee Retirement System (MPSERS) defined benefit pension and retiree health benefit plans.

In summary, Michigan spends a relatively high share of its fiscal capacity on education. However, when we look at national data at how expenditures are made, we see that Michigan is among the highest states in terms of per-pupil employee benefits, student support services, and other support services. It is among the lowest states in terms of per-pupil instructional spending.

A policy option might be to try to shift spending from non-instruction-related items to instruction-related categories. Among the non-instruction-related categories, Michigan is already ranked toward the bottom of states in administrative and operations and maintenance expenses. That leaves the option of trying to tackle benefit costs, which is difficult to do and could be counterproductive if that makes it difficult to retain and attract qualified teachers. Nonetheless, the state is addressing these issues with its move toward a defined contribution pension system and, at the district level, with early retirement incentive packages.

C. District Expenditures per Pupil

The prior section gives a “macro” picture of the funds available to districts, i.e., their revenue, on a state-by-state basis. That section documents Michigan's slide at the state

²⁴This is \$1,790 in 1993 dollars, which implies that there has been a real increase in benefit costs of 44 percent per pupil over the period between 1993 and 2011.

Table 4-3. Share of K–12 Revenue Spent on Instruction in 1993–94 and 2011–12, by State

State	1993–94 Share of Revenue Spent on Instruction	2011–12 Share of Revenue Spent on Instruction	1993–94 Rank	2011–12 Rank
Alabama	54.4%	52.1%	31	24
Alaska	41.9	49.3	51	43
Arizona	47.3	46.2	49	50
Arkansas	55.3	49.6	24	41
California	51.8	51.1	43	31
Colorado	53.7	48.2	35	47
Connecticut	59.6	57.8	4	8
Delaware	59.4	58.2	5	4
DC	47.0	39.3	50	51
Florida	49.3	55.3	48	14
Georgia	55.4	53.6	23	19
Hawaii	54.4	50.3	32	37
Idaho	56.3	52.6	16	23
Illinois	55.7	50.8	21	33
Indiana	53.1	48.5	38	45
Iowa	56.8	50.7	11	34
Kansas	55.0	50.7	26	35
Kentucky	55.8	52.1	20	25
Louisiana	54.6	53.1	29	21
Maine	60.3	55.5	3	12
Maryland	56.3	55.3	15	15
Massachusetts	55.1	57.7	25	9
Michigan	51.4	49.7	44	40
Minnesota	56.3	53.8	14	18
Mississippi	56.1	50.1	19	39
Missouri	52.9	51.2	39	30
Montana	58.4	54.9	9	16
Nebraska	55.4	55.9	22	11
Nevada	52.1	52.0	41	26
New Hampshire	58.7	60.2	8	2
New Jersey	53.2	56.4	36	10
New Mexico	50.9	47.9	47	48
New York	62.2	62.6	2	1
North Carolina	56.7	58.2	12	5
North Dakota	56.6	48.3	13	46
Ohio	53.9	49.5	34	42
Oklahoma	52.0	48.7	42	44
Oregon	54.3	51.7	33	28
Pennsylvania	57.7	52.9	10	22
Rhode Island	64.6	58.1	1	6
South Carolina	52.1	46.9	40	49
South Dakota	56.3	51.0	17	32
Tennessee	56.2	59.7	18	3
Texas	51.0	50.6	45	36
Utah	54.9	51.8	27	27
Vermont	59.4	53.4	6	20
Virginia	53.2	54.4	37	17
Washington	50.9	51.4	46	29
West Virginia	54.7	58.0	28	7
Wisconsin	58.8	55.3	7	13
Wyoming	54.6	50.2	30	38
U.S. Average	54.8	52.6		

SOURCE: Common Core Data System, NCES.

Table 4-4. Median District Current Expenditures per Pupil and 90th–10th Percentile District Gap in Current Expenditures per Pupil, 2010–11, by State

State	Median District Expend. per Pupil	Rank	Gap	Rank	Number of Districts
Alabama	\$8,613	43	27%	6	131
Alaska	20,315	1	149%	50	39
Arizona	7,558	49	42%	23	91
Arkansas	8,847	38	36%	13	239
California	8,295	45	57%	39	397
Colorado	8,694	39	51%	34	130
Connecticut	14,832	6	32%	9	115
Delaware	11,862	14	47%	30	16
District of Columbia	18,475	2	0%	1	1
Florida	9,021	35	25%	3	67
Georgia	9,098	34	36%	12	178
Hawaii	12,004	13	0%	1	1
Idaho	7,103	50	67%	46	87
Illinois	9,464	28	46%	29	394
Indiana	8,649	42	41%	19	289
Iowa	9,131	32	26%	5	314
Kansas	10,034	23	41%	18	247
Kentucky	9,109	33	32%	10	169
Louisiana	10,519	20	55%	38	72
Maine	13,080	11	43%	25	96
Maryland	13,135	10	28%	7	24
Massachusetts	12,778	12	46%	28	211
Michigan	8,914	37	37%	14	500
Minnesota	9,523	27	40%	17	304
Mississippi	8,238	46	47%	31	148
Missouri	8,309	44	42%	24	386
Montana	11,554	16	63%	44	18
Nebraska	11,222	19	48%	32	174
Nevada	9,796	24	89%	49	16
New Hampshire	13,996	8	54%	36	65
New Jersey	14,851	5	52%	35	220
New Mexico	10,201	22	83%	47	70
New York	17,608	3	66%	45	627
North Carolina	8,684	40	38%	16	115
North Dakota	10,505	21	61%	43	73
Ohio	9,590	25	41%	21	607
Oklahoma	7,805	47	43%	26	359
Oregon	9,222	30	41%	22	140
Pennsylvania	11,462	18	45%	27	494
Rhode Island	13,773	9	38%	15	31
South Carolina	8,940	36	55%	37	83
South Dakota	8,657	41	57%	40	105
Tennessee	7,566	48	25%	4	122
Texas	9,135	31	49%	33	849
Utah	6,800	51	88%	48	40
Vermont	14,069	7	58%	41	30
Virginia	9,567	26	36%	11	130
Washington	9,406	29	41%	20	209
West Virginia	11,852	15	22%	2	55
Wisconsin	11,476	17	28%	8	354
Wyoming	16,548	4	59%	42	43

NOTE: Gap is per-pupil expenditure for district at the 90th percentile in the state divided by per-pupil expenditure for the district at the 10th percentile in the state, expressed as a percentage.

SOURCE: Common Core Data System, NCES.

level over the past decade, and it documents how the shift in funding mechanism undertaken with Proposal A placed Michigan in a small subset of states that had major changes over the past two decades. In this section, we examine expenditures by districts on a per-pupil basis.

The Common Core Data system from NCES contains financial data for each local education agency (LEA) in the country. The database includes over 19,000 LEAs, although not all of these are K–12 districts. Some are intermediate school districts, charter schools, or educational institutions for students with special needs. Others are districts that may cover only elementary schools or only high schools. This section examines data from LEAs that are considered to be traditional school districts (including districts with associated charter schools) that have both elementary and secondary education. In the analysis, we have excluded as outliers one very large district (New York City) and several very small districts. We eliminated the latter by setting an arbitrary target of enrollment sufficient to have 20 students in each grade 1 through 12, a total of at least 240 students. We excluded New York City because of its sheer size of nearly a million students. We also eliminated districts with zero or unreported current expenditures. With these restrictions, our sample includes 9,675 K–12 districts.

For this sample, the average current expenditure per student in the most recent year available (2010–11) is \$10,663, and the average student enrollment is 4,510 students.²⁵ The variation is quite large, particularly in enrollment, which ranges from a low of 241, just over the cutoff point, to a high of 667,273 (Los Angeles Unified School District). Current expenditures per student range from a low of \$647 to a high of \$50,462. The school district with the highest per-student expenditure in the sample is a small district in New York

State. There are six other districts with current expenditures per student above \$40,000 and they are small districts located either in New York or Alaska.

Table 4-4 lists the current expenditures per student for the median K–12 district (in terms of per-pupil expenditures); the difference, in percentage terms, between the total current expenditures per student for the district at the 90th percentile and the district at the 10th percentile in each state's distribution of expenditures per pupil; and the number of districts in each state. Note that the ranking for the difference in the gap between the 90th percentile and 10th percentile districts goes from smallest to largest.

Alaska is clearly an outlier among the states. It has by far the highest median current expenditure per student, but also it has the largest gap in spending between the 90th and 10th percentile districts, with a difference of 149 percent. The District of Columbia, as a single, large urban district, is also apparently an outlier in terms of expenditures per student, with almost \$18,500. Note that Utah and Idaho, with median expenditures per pupil of around \$7,000, are significantly lower than all other states. Ignoring the single-district cases of Hawaii and DC, West Virginia has the least disparity in spending, according to the gap measure, with only a 22 percent difference between the 90th and the 10th percentile district. Consistent with the data on state-by-state comparisons of spending, Michigan is relatively low in the median expenditure measure, where it is ranked 37th.²⁶ Its median district spends \$8,914 per student. However, the gap in per-pupil spending between the 90th percentile district and the 10th percentile district — at 37 percent — is relatively small, with Michigan ranked 14th.

²⁵About 80 percent of the districts in our sample include preschool expenditure and enrollment data. The mean per-pupil expenditures for districts with (without) preschool is \$10,466 (\$11,297); the mean enrollment for districts with (without) preschool is 4,746 (3,685).

²⁶Michigan is ranked 24th according to total expenditures on current operations of all local education agencies in the state divided by total student count (Cornman, et al., 2013). The difference between the measure presented here and the total expenditures on current operations per student is that the former excludes expenditures on education by agencies that are not included in our list of K–12 districts. This includes intermediate school districts, schools devoted to students with specific needs or opportunities, and charter schools. It also excludes Detroit Public Schools, which is the largest district in the state and spends \$13,415 per student. Leaving that school district out of the calculation of total expenditures per student for the state will lower the state's ranking in that category, although other states are in similar situations.

Table 4-5. Funding Mechanisms, by State (2011)

State	Foundation	Local Effort Equalization	Equalization	Full State Funding	Flat Grant	Other
Alabama	1	1	0	0	0	0
Alaska	1	1	1	0	0	0
Arizona	0	1	1	0	0	1
Arkansas	1	1	0	0	0	0
California	1	0	0	0	0	0
Colorado	1	0	1	0	0	0
Connecticut	1	0	1	0	0	0
Delaware	0	0	1	0	1	0
District of Columbia	1	0	0	0	0	0
Florida	1	1	1	0	0	0
Georgia	1	1	1	0	0	0
Hawaii	0	0	0	1	0	0
Idaho	0	0	0	1	0	0
Illinois	1	0	0	0	1	0
Indiana	1	0	0	1	0	0
Iowa	1	0	0	0	0	0
Kansas	0	1	1	0	0	0
Kentucky	1	1	0	0	1	0
Louisiana	1	0	1	0	0	0
Maine	1	1	0	0	0	0
Maryland	1	1	1	0	0	0
Massachusetts	1	0	0	0	0	0
Michigan	1	0	0	0	0	0
Minnesota	1	0	0	0	0	0
Mississippi	1	1	0	0	0	0
Missouri	1	1	0	0	0	0
Montana	1	0	1	0	1	0
Nebraska	0	0	1	0	0	0
Nevada	1	0	0	0	0	0
New Hampshire	1	0	0	1	0	0
New Jersey	1	0	1	0	0	1
New Mexico	0	0	1	0	0	0
New York	1	0	1	0	0	0
North Carolina	1	0	0	0	0	0
North Dakota	0	1	0	0	0	0
Ohio	0	0	1	0	0	1
Oklahoma	1	0	1	0	0	1
Oregon	1	1	1	0	0	0
Pennsylvania	1	1	1	0	0	0
Rhode Island	0	0	0	0	0	1
South Carolina	1	1	0	0	0	1
South Dakota	1	1	1	0	0	0
Tennessee	0	1	1	0	0	0
Texas	1	1	0	0	0	0
Utah	1	0	0	0	0	0
Vermont	0	0	0	1	0	0
Virginia	1	1	1	1	1	0
Washington	0	1	0	1	0	0
West Virginia	1	1	0	0	0	0
Wisconsin	0	1	0	0	0	0
Wyoming	1	0	0	0	0	0
Total no. of states	37	23	22	7	5	6

SOURCE: <http://www.edcounts.org/createtable/viewtable.php>.

D. Financing Mechanisms

States finance K–12 education in several ways:

- Foundation: State guarantees minimum amount of funding for each school district; requires districts to raise local portion of this amount
- Local equalization effort: State guarantees that for any given level of local taxation effort a district will receive equal yield
- Equalization: State accounts for property wealth, taxation effort, and relative district need to determine funding levels
- Full state funding: State requires that state provides all money needed for basic education
- Flat grant amount: State uniformly allocates dollars per student or instructional unit.
- Other: Other type of funding plan

According to EdCounts, the research arm of *Education Week*, the funding mechanisms adopted by the states and the District of Columbia can best be described according to Table 4-5. There is some overlap in classification of financing

schemes for some states; that is, they are not necessarily mutually exclusive.

As shown in the table, 37 states use a foundation grant approach, whereas 23 use local equalization and 22 use equalization. The remaining 12 use either full state funding or flat grant. Of those using a foundation approach, 17 also use local effort equalization, 15 use equalization, and 7 use either full state funding or flat grant. While the foundation grant approach dominates, the other mechanisms are used in combination with that approach.

How, if at all, does the funding mechanism of a state influence the financing in the state? As displayed in Table 4-6, current expenditures per student vary across states that use different funding schemes. The 22 states that have adopted an equalization approach have the highest average per-student expenditure, whereas the seven states that use full state funding have the lowest per-student expenditures. Not surprisingly, those same seven states that use full state funding rely the most on state revenue and rely the least on local revenue to finance K–12 education.

Table 4-6. Descriptive Statistics about Districts, by State Financing Type

	Foundation	Local Effort Equalization	Equalization	Full State Funding	Flat Grant
Mean/median current exp/student	\$ 10,808	10,020	11,874	9,789	9,833
Mean (or median) enrollment	4,822	4,973	4,600	4,837	4,647
Share of district revenue from:					
Local	41.6	39.9	44.6	31.5	41.2
State	46.9	46.4	44.2	58.6	47.4
Federal	11.5	13.6	11.2	9.8	11.4
Property tax	72.4	72.6	75.6	70.8	76.9
Percent black	9.5	10.9	8.3	5.9	8.8
Percent free or reduced price lunch	39.0	42.6	36.1	36.9	39.6
(# districts, # states)	(7504, 37)	(4429, 23)	(4045, 22)	(811, 7)	(727, 5)

SOURCE: Authors' calculations from its trimmed version of Common Core Data System, National Center for Education Statistics.

To explore the effects of state policies and the use of revenue sources, we examine those groups of states that are considered to follow a particular policy and compare the variance in district revenues within a state to the variance across states. For example, for those 23 states classified as using local effort equalization as a financing policy, the within-state variance is 60 percent higher than the between-state variance, whereas for the remaining 28 states (and DC) that do not use local effort equalization, the within-state variance is only 17 percent higher. The variance decomposition suggests that this method of financing, in which the state subsidizes districts so the same tax rate can generate the same revenue, yields a much larger share of the variance due to within-state differences relative to cross-state differences, as compared with states that do not use that financing method. Higher within-state variance is also found for the share of state revenue to local districts, which also suggests that the use of state funds to help individual districts within the state generate the same revenue with equal tax effort. In contrast, states that have not adopted a policy of local equalization effort financing have higher variance in the share of state revenue across states than within states.

E. Financing Mechanisms in Exemplary States

Chapter 3 identified seven exemplary states based on levels and trends of student achievement, both for all students as a whole and for low-income students. We focus on the funding mechanisms in these states (in alphabetical order).

Florida. As noted in Table 4-3, Florida has a complex system of funding that relies on a foundation grant, local effort equalization, and equalization. The foundation grant is referred to as the base student allocation, and is a little over \$4,400 for 2014–15. State funding is determined by multiplying the allocation by a weighted measure of full-time equivalent (FTE) students. Several factors are used to weight the FTEs, almost all of which are intended to capture differences in costs.

Among the factors that increase the weighted FTEs are “sparsity” of the district; grade levels; declining enrollment; and enrollment of students in special education, gifted and talented programs, and English for Speakers of Other Languages (ESOL). The sparsity factor is intended to adjust for the relatively higher operating costs of smaller districts. FTEs in grades K–3 increase FTE weights by 8.9 percent, and FTEs in grades 9–12 increase FTE weights by 3.1 percent. Districts with declining enrollment get an increased weight, and finally, the state has a complex system for weighting special education, gifted and talented, and ESOL FTEs.

In addition to the state funding, local districts are allowed to levy up to 0.748 mills for operating expenses, and with a supermajority, may levy an additional 0.250 mills for critical operating or capital outlay expenditures. The local levy is equalized at the state average per unweighted FTE.

In short, Florida places considerable weight on cost differentials, and allows local districts to raise their own funds through a state-equalized property tax levy.

Indiana. Legislators and policymakers in Indiana are currently debating whether the state’s school funding system over- or undercompensates for the cost of educating low-income students (Wang 2014). Local school corporations or charter schools are mainly funded by the state grant, which is determined by a foundation funding amount multiplied by an adjusted average daily membership (ADM). The foundation funding amount in 2015 is about \$4,600. The adjustment to the ADM is a multiplier determined by the count of students eligible for free or reduced price lunch. This multiplier is called an adjusted complexity index, and it is calculated by multiplying the percentage of students on free or reduced price lunch by about one-half,²⁷ and then adding that to 1.0. So, for example, if a school district has about 50 percent of its students eligible for free or reduced price lunch, its adjusted complexity index would be approximately 1.25.

²⁷The exact multiplier is 0.4974.

Beginning in 2012, an adjustment was instituted based on enrollment size. This adjustment was zero for schools with an ADM of less than 500 in the previous school year; \$150 for schools with an ADM of between 500 and 1,000; and \$150,000 divided by the previous-year ADM for schools with an ADM greater than 1,000 students.

This adjusted foundation funding amount is modified further by a “transition to foundation” calculation. If the funding amount is approximately equal to the foundation grant value, there is no modification. Otherwise, the modification to the funding amount is approximately plus or minus 15 percent of the difference between it and the foundation grant value, so that districts move toward equalization. Over and above this modified, adjusted basic state grant are state funds allocated for honors diplomas, special education, career and technical education, and full-day kindergarten. Also, transportation services and building improvements are funded through separate local tax levies. In 2009, the state disallowed the use of local levies for operating expenses. Unlike traditional public schools, charter schools receive no local property tax funding for capital projects or transportation.

In summary, the funding philosophy in Indiana heavily weights the level of low-income student enrollment, and otherwise leans toward full state funding and eventual equalization.

Maryland. The finance system in Maryland, which was reformed in 2002 as the Bridge to Excellence program, is a foundation grant system that has a local equalization feature. The legislature based its foundation grant on the results of an adequacy study, and by fiscal 2015, the grant has risen to a level of \$6,860. The funding is intended to be split equally between the state and local districts. The total general education support for the state equals the foundation grant multiplied by FTE enrollments. One-half of this is the state share. The other half is the local share, which is allocated by the share of statewide property wealth held in a district. The state share then is the residual between the local share

and the foundation grant. In wealthy districts, the local share per student may exceed the foundation, and so the state share would theoretically be set at 0. However the Bridge to Excellence program set a minimum of 15 percent for the state share.

Maryland has an equalization program, the Guaranteed Tax Base Program, which provides state funding to local districts with average property wealth per pupil less than 80 percent of the statewide average. It also adjusts funding based on the geographic cost of education and provides additional funds to districts that do not receive at least a 1 percent increase in state aid.

The state pays the entire cost of pension/retirement benefits for eligible school personnel.

Maryland also has significant funding for special education students, compensatory education (low-income) students, and English language learning students. The supplemental funding for these students are 74 percent, 97 percent, and 99 percent of the foundation grant, respectively. For example, a student eligible for free or reduced price lunch would have a funding level of 1.97 times the foundation grant.

In summary, Maryland has a foundation grant that was originally set by an adequacy study. The foundation grant is intended to be equally met with local tax revenue, although the local share is equalized with state funds. The foundation grant has an adjustment for differential costs by geographic area. Finally, the state has quite significant supplemental funding for special education, compensatory (at-risk) education, and English language learners.

Massachusetts. Like Maryland, Massachusetts has a foundation grant system, and the funding is shared between the state and local school districts. Unlike other states with a foundation grant system, Massachusetts actually has several grant levels that adjust for cost differentials. A district's

foundation budget is derived by multiplying the enrollment in 14 categories by cost rates in 11 functional areas.²⁸ The enrollments are pupil counts as of October 1 of the previous school year and are classified into the following 10 categories:

- Regular education or special education
- Regular or special education half-day kindergarten
- Regular or special education full-day kindergarten
- Regular or special education elementary (grades 1–5)
- Regular or special education junior high/middle (grades 6–8)
- Regular or special education senior high (grades 9–13)
- Limited English pre-kindergarten
- Limited English half-day kindergarten
- Limited English (grades 1–12)
- Vocational education

Increments are added to the foundation grants for students who fall in one of the following three categories: in-district special education, out-of-district special education, and low-income status (eligible for free or reduced price lunch). Pre-school and half-day kindergarten program enrollments count as 0.5 FTEs. The functional areas are as follows:

- Administration
- Instructional leadership
- Classroom and specialist teachers
- Other teaching services
- Professional development
- Instructional equipment & technology
- Guidance and psychological
- Pupil services
- Operations and maintenance
- Employee benefits/fixed charges
- Special education tuition

Each pupil generates a specific cost in each of these functional areas. The costs are higher at the elementary and upper grades (FY2015 costs per elementary student

are \$7,353; per middle school student, \$6,971; and per high school student, \$8,693), and higher for limited English and vocational programs. Special education and low-income students have higher costs as well. The FY2015 increment for low-income students in grades 1–8 is \$3,422 and in grades 9–12 is \$2,767.

A wage adjustment factor is used for districts in a geographic area where average wages are higher than in other areas of the state.

The local share of the cost is determined by the district's share of total property wealth in the state and total income in the state. The state pays the difference between the foundation budget and the local share. Charter school tuition rates are based on the foundation budgets calculated for each sending district's pupils. Charter school tuition is the name of the state payments to the charter school; they are not payments required from students to attend.

In short, the funding mechanism in Massachusetts is intended to split the costs between the state and the local district. Furthermore, it is based on cost differentials, takes account of variation in wealth among districts, and has a very high (relative to other states) support level for low-income students.

New Hampshire. New Hampshire has a relatively straightforward foundation grant system. It is intended to be based on a cost of adequacy and will be adjusted every two years by the Consumer Price Index-Urban consumers, Northeast Region, for "services less medical care services." In FY 2014, the foundation grant base was \$3,498. That base is raised by \$1,719 for students who are eligible for free or reduced price lunch, \$1,882 for special education students, \$648 for English language learners receiving English instruction, and \$648 for each 3rd grade pupil not proficient in the reading component of the state assessment and not eligible for the other adjustments.

²⁸This system was designed by a committee of school district superintendents and a consultant economist in the early 1990s (Moscovitch 1992). The costs were intended to constitute "an adequate — but not excessive — level of funding."

The state determines the total state support for school districts and notifies each municipality annually about how much it needs to raise in property tax. Municipalities send that portion of their property tax receipts directly to school districts.

New Jersey. This state's funding mechanism is based on the School Funding Reform Act of 2008. It is a foundation-based formula with district equalization. In recent years, the aid has not been fully funded because of budgetary constraints.

In FY 2011, the per-pupil foundation grant was \$9,971. This grant is multiplied by a weighted projected student count to determine a district's adequacy budget. The weights are 0.50 for half-day kindergarten; 1.0 for full-day kindergarten through grade 5; 1.04 for grades 6–8; and 1.17 for grades 9–12. County vocational students are given a weight of 1.31. Students eligible for free or reduced price lunch increase the relevant grade level weight by an additive factor of 0.47 to 0.57, depending on the low-income concentration in the district. The 0.47 factor applies for districts where the concentration of low-income students is no more than 20 percent, and the 0.57 factor applies for districts where the concentration of low-income students is at least 60 percent; interpolated factors apply for districts within this range of low-income concentration. English language learners garner an additional weighting factor of 0.50 if they are not low-income, and 0.125 if they also qualify for the low-income supplemental weight. Special education students are provided higher foundation grants depending on actual costs.

On average, local districts' tax levies cover about 25 percent of the total per-pupil aid, although this percentage varies considerably. For districts that have relatively low income and wealth, the state provides equalization aid to cover the per-pupil adequacy budget. The state contributes to the teachers' pension fund, pays the employer share of Social Security

taxes, and supports the cost of post-retirement medical benefits for retirees.

In general, New Jersey has a foundation grant system that weights students in middle school more than those in elementary school, and students in high schools more than those in middle school. The state has a fairly large supplement for low-income and LEP students — on the order of \$5,000 per student. Local communities are able to support school budgets above and beyond the foundation grant.

Pennsylvania. In 2006, the Pennsylvania legislature directed the State Board of Education to conduct an adequacy study to determine the "basic cost per pupil that will permit a student to meet the state's academic standards and assessments." The base cost in the 2010–11 fiscal year was \$8,950. A district's allocation equals that base cost multiplied by a grade-level modified ADM. Half-day kindergarten is weighted at 0.50; elementary students are weighted at 1.0; and secondary students (grades 7–12) are weighted at 1.36.

The state has poverty and English language learner supplements. The poverty supplement is the product of the base cost and the number of students eligible for free or reduced price meals, multiplied by 0.43. The English language learner supplement is the number of students identified as limited English proficiency (LEP), multiplied by the product of the base cost and a factor dependent on ADM.²⁹

The state also has a district size supplement and an adjustment for geographic price differences. The size supplement is the greater of zero or the product of the base cost, the ADM, and ADM-dependent adjustment factor.³⁰ The geographic price difference is based on a cost metric.

²⁹ The ADM factor is: $3.753 - 0.23 \times \ln(\text{ADM})$, where $\ln()$ refers to the natural log. The effective factor is subject to a minimum of 1.48 and a maximum of 2.43.

³⁰ This adjustment factor is: $0.483 - 0.05 \times \ln(\text{ADM})$.

Table 4-7. Summary Characteristics of State Finance Mechanisms

Characteristic	MI	FL	IN	MA	MD	NH	NJ	PA
Instructional expenditure per pupil (2011)	\$5,791	\$5,511	\$5,445	\$9,280	\$8,712	\$8,793	\$10,131	\$8,020
Based on adequacy study	No	No	No	Yes	Yes	Yes	No	Yes
Support for at-risk students (incremental \$)	Yes (≈ \$600)	No	Yes (≈ \$2,200)	Yes (≈ \$2,500 – 3,000)	Yes (≈ \$6,500)	Yes (≈ \$1,750)	Yes (≈ \$4,700 – 5,700)	Yes (≈ \$3,800)
Support for LEP students (incremental \$)	No	Yes (14.7% of per pupil grant)	Yes (≈ \$90)	Yes (7–34% of per pupil grant dep. on grade)	Yes (99% of per pupil grant)	Yes (\$685)	Yes (50% of per pupil grant)	Yes (≈ \$35)
Grade-level adjustment	No	Yes	No	No	Yes	No	Yes	Yes
Declining enrollment adjustment	No	Yes	No	No	No	No	No	No
Adjustments for intrastate price differences	No	Yes	No	Yes	Yes	No	No	Yes
Adjustment for district size	No	Yes	Yes	No	No	No	No	Yes

Summary. Table 4-7 summarizes several characteristics of the financing mechanisms from the states just described and for Michigan. Michigan, Florida, and Indiana all have approximately the same level of instructional expenditure per pupil; whereas the other five states in the table have the resources to spend considerably more per pupil for instruction. Four of the states base their support on adequacy studies, and in each of those states, the instructional support per student was over \$8,000 in 2011.

All of the states except Florida provide additional revenue for at-risk (or low-income) students. Note that Michigan's level of support, through the 31a categorical, is much lower than that of other states that support at-risk students. Furthermore, Michigan requires such students to be eligible for free meals,

not reduced-price meals. The level of support in Michigan is also constrained by a pro-ration. The language of the categorical indicates that the per-student support should be 11.5 percent of the foundation grant, which in 2013–14 would have been about \$815.

All of the states in the table except Michigan³¹ have extra support for English language learners (in addition to the funding for at-risk students). In most of the states, this is available only to LEP students who are not eligible for at-risk funding. Four of the states adjust funding by grade level. All four of these weight high school highest; three weight middle school higher than elementary school, and the other weights elementary school higher than middle school. One of the states, Florida, adjusts support for declining enrollment.

³¹ Some districts in Michigan offer instruction for English language learners. However, the documentation that we could find suggested that this was done on a reimbursement basis from federal funds.

Three of the states use price or wage differentials to adjust local support, and three adjust the support for enrollment size. As noted, Michigan does not make any of these adjustments other than to provide extra funding for at-risk students. Michigan fails to adjust funding for many cost factors that exemplary states take into account. Even the adjustment that Michigan does make for at-risk students is much smaller. The state's virtual "one size fits all" approach is out of step with the leading states in terms of student achievement.

F. The Cost of Closing the Gaps in Michigan's Student Achievement

1. Overall Student Achievement

We start with the question of whether academic performance can be increased by simply spending more money. Our empirical work suggests that money does make a difference. Figure 2-1 displays the relationship between results on the MEAP and revenue per pupil in Michigan after the passage of Proposal A. The regression line that fit those data suggested that an increase of \$1,000 in revenue per pupil translated to an increased MEAP passing rate of about 1.5 percentage points. If we assume that the results from the MEAP can be transformed to the NAEP, then the "good news" is that for Michigan to match the U.S. average educational performance it would take "only" an extra \$2,000 per pupil in school funding.³²

Using MEAP results offers a good understanding of the likely impact of increasing per-pupil revenue: not only is it specific to the Michigan context, but the sudden and unexpected large changes in per-pupil revenue in certain districts make it easier to isolate the effects on achievement of greater money from any other policy differences across districts.

The changes in Proposal A funding per student by district can be viewed as being a true natural experiment.

These MEAP results suggest that money, as it is typically spent, matters. From a benefit-cost standpoint, these results are somewhat encouraging. An extra \$2,000 or so per pupil, or around \$30,000 over the entire K-12 period, would move Michigan's academic performance up to U.S. levels, which would increase future earnings by about 2 percent, or about \$30,000 over an entire career. Of course, these future earnings would have to be discounted somewhat to reflect that a dollar 30 years from now is worth less than a dollar today. However, the policy might pass a benefit-cost test if we include other benefits of education other than increased earnings. Some of these benefits include private nonmonetary benefits, such as improved health and self-image or greater reading enjoyment, and public nonmonetary benefits, such as improved civic participation, less criminal activity, and greater social cohesion.

Still, these results are discouraging in terms of policy proposals to solve educational disadvantages by simply spending more money. Even erasing the modest disadvantage that Michigan has relative to the U.S. average would require spending \$2,000 extra per pupil per year. To match a leading state such as Massachusetts would require spending closer to an extra \$10,000 per pupil.³³

2. Gaps between Low-Income and Non-Low-Income Students

The levels of additional funding that would be needed to overcome the extremely large performance differentials between low-income students and non-low-income students are so large that simply trying to overcome the gap by

³²We assume a uniform percentile increase in student performance. The coefficient of 0.00146 times a \$1,000 increase in per pupil funding will increase the MEAP pass rate by 1.46 points. If this corresponds to a uniform percentile increase in all students' performance, then for Michigan to match the U.S. advantage of 3.1 percentiles for low-income students, and 3.4 percentiles for non-low-income students, it would take higher spending of \$2,123 for low-income students ($= 3.1 \text{ percentiles} \div 1.46$), and \$2,329 for non-low-income students ($= 3.4 \text{ percentiles} \div 1.46$).

³³Massachusetts, as reported in Table 3-4 above, has an advantage in the NAEP over Michigan of 11.1 percentiles for low-income students and 14.7 percentiles for non-low-income students. Dividing this by the 1.46 implied percentile effect of an extra \$1,000 in per pupil funding yields an implied requirement that funding per pupil increase by \$7,603 ($= \$1,000 \times 11.1 \div 1.46$) or \$10,068 ($= \$1,000 \times 14.7 \div 1.46$).

investing more resources precludes serious contemplation. We estimate that it would require directing to low-income students more than double the current level of *total* spending in districts with the average percentage of low-income students.³⁴ This is consistent with a broader research literature on how much needs to be spent to overcome performance gaps between low-income students and non-low-income students. This research literature frequently implies that the required extra spending is at least doubling spending per student (Golebiewski 2011; Duncombe and Yinger 2005). The gaps between school districts consisting almost entirely of low-income students, versus districts with almost no low-income students, imply that we would need to spend perhaps four times the current level per pupil in the former districts to eliminate the gap.³⁵ It seems safe to say that such increases for low-income students are infeasible.

But even though it is infeasible to close the test score gaps, keeping the gaps from growing — that is, to achieve similar academic progress for both income groups — will ultimately result in a more equitable income distribution. Similar test

score gains for low-income and non-low-income students will have similar dollar effects on adult earnings, on average, for both groups. But because low-income students on average have lower expected future earnings as adults than non-low-income students, these similar dollar gains have much larger percentage effects on future earnings. The earnings distribution becomes more equal when we add similar dollar future earnings to all income groups.

For example, as shown in Table 3-2, the gain in Michigan's NAEP score index for low-income students and non-low-income students was similar, at 8 points for low-income students and 8.5 points for non-low-income students. This test score gain would be expected to result in similar dollar gains in future earnings, which would be about 5–6 percent of overall average earnings. But as a percentage of the expected future earnings of both groups, this test score boost would be expected to boost future earnings of low-income students by 7.2 percent, versus 4.7 percent for non-low-income students.³⁶

³⁴ If each \$1,000 of extra spending increases performance by 1.46 percentiles as estimated in the regression reported in Figure 2-1, then the 28.4 percentile gap between low-income and non-low-income students in Michigan on the NAEP would require extra spending of \$19,452 ($= \$1,000 \times 28.4 \text{ percentiles} \div 1.46$). Similar calculations suggest that the 31.3 percentile gap in the MEAP between low-income students and non-low-income students would be overcome with an extra \$21,507 in spending.

³⁵ As shown previously, the percentile gap between 100 percent low-income school districts and 0 percent low-income school districts is about 60.9 percentiles. The implied extra required spending is \$41,712 ($= \$1,000 \times 60.9 \div 1.46$).

The test score gains for low-income students move them from the 26.5 percentile to the 34.5 percentile of the 2013 test score distribution, a gain of 8 percentiles.

³⁶ The test score gains for non-low-income students move them from the 54.0 percentile to the 63.4 percentile of the 2013 test score distribution, a gain of 9.4 percentiles. Based on Chetty et al. (2011), these percentile gains should be multiplied by 0.642 to predict percentage earnings gain as a percent of average adult earnings, which yields 5.1 percent for low-income students and 6.1 percent for non-low-income students. But expected future earnings of low-income students are 71.4 percent of overall average earnings, whereas expected earnings for non-low-income student are 130.1 percent of overall average earnings (Bartik 2014). Therefore, the percentage boost for low-income students as a percent of their expected future earnings is 7.2 percent ($= 5.1 \div 71.4$), and percentage boost for non-low-income students is 4.7 percent ($= 6.1 \div 130.1$).

V: Policy Recommendations

A. Targeting Resources

The analyses of the extra resources needed to close gaps at the end of the previous chapter simply look at the educational performance effects of spending money without regard to exactly how that money is spent. However, certain educational practices are known to more effectively raise student achievement rather than simply increasing school funding across the board. Reducing class size in early elementary school is expensive, but it has a larger effect per dollar on academic achievement and later outcomes than aggregate increases in school funding (Krueger 1999). High-quality child care from birth to age 5 is also very expensive, but, dollar-for-dollar, it has been shown to improve outcomes for disadvantaged students more than a general increase in K-12 funding (Bartik 2014). High-quality child care and preschool are cost-effective because these early interventions take place when children's brains are more malleable. Preschool can be especially effective, as children can be taught in larger class sizes than in early childhood, lowering costs. Preschool has also been shown to be effective for both low-income students and middle-class students, whereas child care seems to make a significant difference only for low-income students (Bartik 2014).

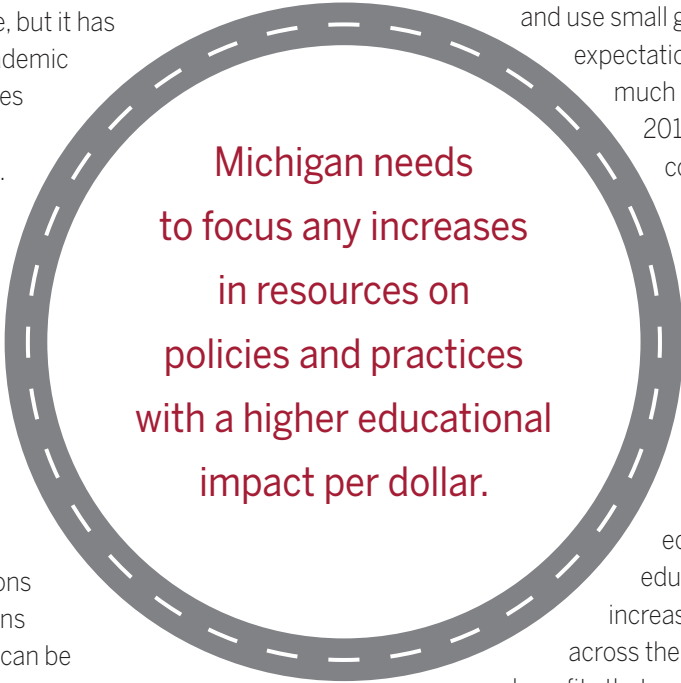
High-quality summer school for students who are behind grade level is also a high-productivity activity if students can be motivated to engage in summer school, as it targets students who are behind and focuses on their specific

academic deficiencies (Jacob and Lefgren 2004). High school career academies that provide high-quality career and technical education in small learning communities have also been shown to be quite cost-effective in improving student outcomes, although these studies apply only to students interested in career and technical education (Kemple 2008). Studies of effective charter schools for low-income students suggest that schools that lengthen the school year

and use small group tutoring with high expectations for every student have much better academic results (Fryer 2012). Targeted math tutoring and counseling for students who are behind has also been shown to be very cost effective in improving student outcomes (Cook et al. 2015).

Table 5-1 on the next page summarizes the implications of these studies for the relative costs and future economic benefits of various educational policies. Simply increasing education spending across the board has future earnings benefits that are somewhat less than costs,

although the addition of non-pecuniary benefits (such as better health or reduced crime) might make this benefit-cost ratio exceed one. In contrast, there are many specific economic policies that target particular grades, particular groups of students, or particular educational practices, and in each case have economic benefit-to-cost ratios that greatly exceed one. Given its limited fiscal capacity, Michigan needs to focus any increases in educational resources on these policies and practices with a higher educational impact per dollar.



Michigan needs
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Table 5-1. Future Economic Benefits and Program Costs of Various Educational Policies

Policy	Effect on Future Earnings per Child	Program Costs per Child	Economic Benefit to Cost Ratio	Target Group
General school funding effects	\$7,000	\$11,000	0.6	All students
Full-time full-year child care from birth to age 5 (Educare) for disadvantaged families	\$134,000	\$87,000	1.5	Economically disadvantaged students
Reduced class-size K-3	\$22,000	\$11,000	2.0	All students
Universal full-day pre-K	\$53,000	\$10,000	5.3	All students
High school career academies	\$26,000	\$3,000	8.7	Students interested in CTE
Mandatory elementary summer school for one year for children who are behind	\$18,000	\$2,000	9.0	Students who are academically behind
One hour per day math tutoring plus cognitive behavioral therapy for disadvantaged 9th graders	\$54,000	\$5,000	10.8	Students who are academically behind
Five best school practices (longer school year & school day, small group tutoring, frequent feedback to teachers, more use of testing to guide instruction, high expectations)	\$26,000 per year	\$2,000 per year	13.0	High-poverty schools

NOTE: Costs and benefits are discounted back to year intervention would begin. Costs and benefits are measured in year 2012 dollars. The social discount rate used is 3 percent. Future earnings are assumed to increase in real terms by 1.2 percent per year. Earnings effects are calculated either directly, or from test score impacts, based on Chetty et al. (2011).

Thus, our first recommendation is that the state should conduct a competitive grant program that we have dubbed the Smart Educational Expenditure Demonstration (SEED) program. Grants should go to traditional districts or charter schools that implement an educational practice that has been shown to be effective, such as the ones in the table. The practices that get funded should be limited to teaching and learning; that is, they should preclude non-instructional

activities. We realize that Michigan does not currently have a considerable level of resources to use to increase its investment into education, but we suggest that a \$200 million grant program may be feasible, especially given the potential benefits relative to costs. If an effective intervention has an average cost per student of \$4,000, then a four-year commitment to the SEED grants will serve 200,000 students. We also feel that this program can help shrink the

achievement gap, so we recommend reserving two-thirds of the grants for districts or charter schools with a large share of students eligible for free or reduced-price meals.

Recommendation #1. The state should implement a four-year competitive grant program for districts (traditional and charter schools) to offer services/interventions that have been shown to be highly effective at increasing student achievement. The districts that receive grants will be required to evaluate the efficacy of their service/intervention.³⁷ A funding level of \$200 million for this Smart Educational Expenditure Demonstration (SEED) initiative will serve 200,000 Michigan students. Two-thirds of the grants should go to districts or charter schools with enrollments of over 50 percent of students eligible for free or reduced-price meals. Intermediate school districts (i.e., regional education service agencies) could both assist local districts (traditional and charter) in preparing applications for the competitive grant and in conducting the evaluations.

B. Local Enhancement Millages

An important result of Proposal A was to improve funding equity across districts. Prior to 1994, the majority of district funding came from operating millages on local property approved by the district's voters. In many locations, these millages were often hard to pass or, if they did pass, did not raise significant funds because of modest property values. Having the state provide a larger share of funding meant a more robust source of revenue for these locations. The improved funding equity among districts that Proposal A brought is laudable, and the system worked well for its first few years because the state's economy was relatively strong, and legislators continued to increase the foundation grant.

However the state's economy has stagnated so that its fiscal capacity is quite limited. We believe that it is time to loosen the straitjacket of Proposal A and allow local districts to raise additional revenue through voter-approved local millages.

These supplemental millages would restore to an extent communities' opportunities to support their schools. In order to promote equity across districts, we propose that these millages be equalized by the state. We furthermore would provide the revenue that gets raised per student to charter schools located in the district.

We have performed simulations of various equalization schemes and millage caps, but it is unclear how many districts would pass a supplemental millage. If the cap is set at 3.0 mills and the state guarantees that local districts will receive at least as much funding per pupil per mill as the district at the 80th percentile of taxable property value, then approximately \$750 million of additional revenue would get injected into the system (about \$600 million from local property tax supplemented by \$150 million from the state).

What can be done to increase the chances that any such increased resources will be used for practices that have a high educational achievement impact? Democratic accountability due to local voting helps provide one incentive for higher productivity activities, but we recommend that the state should require local districts to provide voters with the following information prior to the millage vote:

- how the supplemental funds will be used to supplement not supplant other funding
- targeted student achievement gains from the programs or practices to be funded
- how changes in student achievement will be measured

Recommendation #2. Proposal A should be altered to allow local districts to approve enhancement millages for operating purposes of up to 3.0 mills per year for a maximum of five years. The state should supplement approved millages in districts that are relatively poor in property value.

³⁷ Note that the Michigan Department of Education Program Evaluation Tool could be used for this evaluation or districts that receive a grant could use an alternative, if it were at least as rigorous.

C. Adequacy Study

Many states have undertaken adequacy studies. Aportela et al. (2014) review 39 studies conducted in 24 states since 2003, and this count of studies omits from consideration an important type of adequacy study referred to as an econometric cost function approach. Michigan is about to join the ranks of states with adequacy studies as it enacted P.A. 555 of 2014, which was signed by the governor on January 15, 2015. This law calls for an adequacy study to be completed by March 31, 2016.

Undertaking an adequacy study is an investment, so it needs to yield benefits that justify the cost. From our viewpoint, the major advantage to such a study is that it would provide decision-makers with necessary information. It is highly unlikely that the managerial decision-makers at any firm or enterprise that produces a good or service are unaware of the cost of production of that good or service. Furthermore, firms know the costs of each component of the process of production. Yet, the educational system in Michigan is a complex, multi-output enterprise that has very little information about the cost of production. We do not know the cost of producing an adequately educated student in each grade. We do not know the cost of additional services that might be necessary for at-risk or otherwise disadvantaged students. We have no idea if the expectations that we have for students in terms of achievement of knowledge and skills are realistic given the level of resources that are provided.

Many of the adequacy studies that have been conducted rely on professional judgments about the resources required to provide an adequate education. We believe that determination of adequacy should use an econometric analysis of costs in addition to a qualitative approach. (See Gronberg et al. 2004; Gronberg et al. 2011; Duncombe and Yinger 2011).

Recommendation #3. The adequacy study mandated by P.A. 555 should include an econometric analysis of cost data as well as qualitative data from experts concerning what constitutes best practice.

D. At-Risk Students

Michigan lags behind most other states in the achievement of and funding for at-risk students. Furthermore, our analyses show that when we proxy for at-risk status with eligibility for free lunch, at-risk students' danger of falling behind on achievement is related to the concentration of at-risk students in the district. Higher percentages of low-income students in a district result in lower student achievement for such students than average, and districts with lower percentages of at-risk students have higher than average results for the at-risk population. It is as if a low-income student faces double jeopardy if he or she resides in a district that has a high percentage of such students.

Michigan has a vehicle for providing more funds to districts for at-risk students, the Section 31a categorical, but relative to other states, this categorical is significantly underfunded and provides an equal level of per-pupil support no matter the share of the district's students that are low-income. Given our analyses of student achievement, the need for at-risk funding is greater the higher the percentage of at-risk students in a district. Hence we advocate an allocation of Section 31a funds in a progressive manner, i.e., one that grants a greater per-student amount in districts that have a greater concentration of at-risk students.

As a first step toward more appropriate support for at-risk students, the state should increase the budget for this categorical by \$200 million. Half of that increase would bring the total state support to about \$415 million. The remainder would support a weighting system where per-at-risk-pupil support would be weighted by 1.0 plus 0.5 times the free and reduced price lunch enrollment percentage in the district. This weighting scheme would allow more resources to go to districts with higher percentages of at-risk enrollment.

Recommendation #4. The state should increase its funding level and institute a progressive funding structure for aid for at-risk students (the section 31a categorical). To account for the pernicious effects of concentrated poverty, these funds should be allocated to districts with a formula

that provides a larger per-student amount in districts that have higher shares of at-risk students. Michigan's current extra funding for low-income students is very low compared to the practices of states that are outpacing it in educational achievement gains. Its funding practices need to change, both to increase overall achievement and to provide for greater equity in opportunities. We propose weighting the per-pupil at-risk funding level by $(1 + 0.5)$ times the percentage of free and reduced price lunch eligible enrollment in a district.

E. Declining Enrollment

A well-known shortcoming of a foundation grant system is the financial hardship that it places on a district that has declining enrollment. When a student leaves the district, the full value of the foundation grant is lost in revenue, but the district's costs decline only by the marginal cost of the student, which is generally less than the full value of the foundation grant. If the enrollment decline is substantial or prolonged, it may start a vicious downward spiral—declining enrollment causes less revenue and higher costs per (remaining) student. The higher costs per student may ultimately cause cost cutting and declines in quality, which may lead to further declines in enrollment.

CRC (2015) suggests that using a blended student count over three years will alleviate this problem. That may be a reasonable policy solution. In general, smoothing dollar flows over time helps to overcome temporary “shocks.” However, we suggest that another solution would be an adjustment to a district's state aid payment that accounts for declining enrollment. If a district that lost enrollment were to receive the difference between the foundation grant and the marginal cost of instruction for each student lost, then the services it could provide per student would remain constant, thus preventing the downward spiral. Unfortunately, the marginal cost for each student is uncertain. However, in most cases it is unlikely to exceed half of the foundation grant. Therefore,

we recommend that if a district's enrollment drops substantially (by more than 2 percent), the state should supplement the district's foundation grant support in the current year with a flat payment equal to one-half of the foundation grant times the net enrollment loss³⁸ Michigan is projected to lose approximately 20,000 students between 2013–14 and 2015–16. If half of those annual losses were in districts where the declining enrollment was more than 2 percent, then this supplemental aid would total approximately \$20 million.

Recommendation #5. For districts that have declines in enrollment of more than 2 percent in a year, state aid should include an adjustment for declining enrollment that equals one-half of the foundation grant times the net enrollment loss.

F. Grade-Level Adjustments to the Foundation Grant

Research on class size suggests that smaller class sizes are especially important in early elementary grades. Because more teachers are needed, maintaining smaller classes early on suggests that costs will be higher for early grades than for later elementary grades. To the extent that revenue should reflect cost differentials, one would expect states to provide more revenue per student in the early elementary grades. Indeed, this is done in 13 states: Alabama, Arizona, Delaware, Florida, Georgia, Hawaii, Kentucky, Massachusetts, Minnesota, New Mexico, North Carolina, Oklahoma, and South Carolina.

The other grades where costs are relatively high occur in high school. In grades 9–12, districts must pay for lab equipment, more expensive instructional materials, and more specialized teachers. When one compares funding in grades 9–12 with funding in grades 4–8, we find that 11 states weight students in the former grades more heavily than those in the latter: Alabama, Florida, Massachusetts, Minnesota, New Jersey, New Mexico, New York, Oklahoma, Pennsylvania, South

³⁸ One reason why a declining enrollment supplement is better than a three-year blended student count is that it would not penalize a district with rapid growth, where the marginal cost of additional teachers, classrooms, and transportation may exceed the average cost. A potential downside would be if it allows districts to strategically “game” their student counts

Carolina, and Utah. An additional advantage to providing more funding on average to high school students is that it gives districts a stronger incentive to prevent students from dropping out of high school.

Implementation of these adjustments can be done without changing the total amount of state aid by using weights bigger than 1.0 for students in grades K–3 and 9–12 in determining state aid and weights that are less than 1.0 for students in grades 4–8. The advantage of these adjustments is that revenue will more closely align with costs. The disadvantage is that it will re-allocate funding with “gainers” being districts with a higher proportion of students in early elementary and high school grades and “losers” being districts with a relatively lower proportion of students in those grades. The latter may include urban districts with higher dropout percentages.

Recommendation #6. Michigan should alter Proposal A to provide adjustments to the per-student foundation grant that weights more heavily enrollments in grades K–3 and grades 9–12.

These six recommendations recognize the constraints imposed by the state’s fiscal situation. They call for a modest increase in state support, but they also suggest that resources can be brought to bear from local property wealth in those districts that wish to increase their commitment to education. Resources spent on policies and practices that have research-based evidence of effectiveness can generate large positive impacts.

We believe that these recommendations will be a modest first step along the road to K–12 educational excellence in Michigan.

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