

# School Finance Reform in Michigan: Evaluating Proposal A

## Julie Berry Cullen and Susanna Loeb

### 1. Introduction

Michigan's Proposal A fits within the broad school finance equalization movement. First implemented in 1995,<sup>1</sup> the reform stemmed from concerns about inequities in property tax burdens and expenditures and radically changed the financing of public schools. The primary source of funding shifted from local property taxes to state sales taxes and finance became highly centralized at the state level. A modified foundation system replaced district power equalization as the mechanism for distributing basic aid to school districts. Under the foundation system, spending per pupil was sharply increased in previously low spending districts and was essentially frozen for higher spending districts. This paper describes the nature of these changes, the short-term results, and the tensions that are likely to foster future change. We also briefly touch on the school choice and accountability reforms that Michigan implemented at approximately the same time as school finance reform.

We begin by providing an overview of the condition of education in Michigan. Michigan is currently the state with the 8<sup>th</sup> largest school enrollment. Between 1990 and 1998, Michigan's average daily attendance increased by 7 percent, which is about the median rate across states for the same time period.<sup>2</sup> There have been no comparable shifts in composition, at least according to race/ethnicity. In both 1986 and 1998, approximately 3/4 of students were white and 1/5 were black.<sup>3</sup> Michigan's population is concentrated in the southeast, in and around the Detroit Metropolitan area. Figure 1 shows the enrollment by county in the state.

Despite the growth in enrollment, current expenditures per pupil grew in real terms by 9.2 percent between 1990 and 1998.<sup>4</sup> In 1998, Michigan's current expenditures per pupil were \$7717, 16 percent more than the national average. Figure 2 plots these expenditures over time. Since the 1960s, Michigan has spent more on average than the nation as a whole and this gap has increased over the past decade. This trend can partly be explained by the infusion of new state revenues that was associated with Proposal A.

Relative academic achievement for Michigan students also appears to have improved (though unsteadily) in recent years. Across the nation, 37 states participated in the National Assessment of Educational Progress (NAEP) for 8<sup>th</sup> grade mathematics in 1992, 1996 and 2000. Michigan ranked 18<sup>th</sup> in 1992, 9<sup>th</sup> in 1996, and 13<sup>th</sup> in 2000.<sup>5</sup> Figure 3 shows the percent of 4<sup>th</sup> and 8<sup>th</sup> graders scoring at the basic level or above in math in 2000 for each of the participating states. Michigan is about the same place in the distribution at both grade levels. Figure 4 plots the gains in math between 1992 and 2000 relative to national average gains separately by grade and

---

<sup>1</sup> Here, and throughout the paper, we refer to years by the fiscal year. For example, 1995 refers to the school year 1994-95.

<sup>2</sup> *Digest of Education Statistics* Table 43 (2000).

<sup>3</sup> *Digest of Education Statistics* Table 44 (2000).

<sup>4</sup> We use the CPI for all goods for September of each year to convert nominal values to constant \$2001 values.

<sup>5</sup> In keeping with its mathematics performance, Michigan scored slightly above the national average on all other NAEP tests, including 4<sup>th</sup> grade reading in 1992 and 1998, 4<sup>th</sup> grade science in 2000, and 8<sup>th</sup> grade science in 1996 and 2000.

race/ethnicity. For both grade levels, gains were slightly higher in Michigan than nationally for black and white students.

Overall, Michigan's experience in the 1990s appears to have been favorable, at least on average. Surveys suggest that voters as a whole strongly support Proposal A, though cracks in the system are beginning to show. In the next section, we describe the system that preceded the reform. Section 3 describes Proposal A in detail. Sections 4 through 6 explore the impact of the reform on tax burdens, expenditures, and student achievement. Section 7 discusses the interaction between the school finance reform and the school accountability and school choice reforms. The final section identifies tensions in the system and concludes with prospects for the future.

## 2. Before Proposal A

Prior to Proposal A, Michigan relied on a power equalization program to supplement revenues in districts with low property tax base per pupil.<sup>6</sup> As described by Yinger (this volume), power equalization plans (also known as guaranteed tax base plans or guaranteed yield plans) operate by setting a guaranteed tax base per pupil and allowing districts to choose local tax rates. State aid then supplements revenues raised by providing the difference between what is raised locally and what would have been raised with the same tax rate applied to the guaranteed base. Districts that are subsidized on the margin face a reduced price of additional spending, proportional to own tax base wealth divided by the guaranteed level. If excess local funds are recaptured from high wealth districts, then these districts are taxed on the margin and must raise more than \$1 to increase spending by \$1. In addition to how responsive the demand for education is to price, variations in the design of the program, such as the level of the guarantee and whether there are restrictions on the amount of matched funds, will affect the degree to which spending is equalized across districts of differing wealth.

Michigan's system was not designed in a way that would have been expected to be strongly equalizing. While there was no limit to the amount of tax effort that the state would match, there was no recapture of excess funds from higher wealth districts. Also, over time, the guaranteed base did not rise as rapidly as property values, so that the share of off-formula districts rose throughout the 1970s and 1980s. By the late 1980s, more than three out of every 10 districts were too wealthy to be affected by the system. At that time, the state implemented a weak recapture system, reclaiming a subset of categorical funds from districts with per pupil wealth above the guarantee.

In 1994, the year prior to reform, the guaranteed tax base was set at \$102,500 per pupil. Districts with state equalized value (SEV)<sup>7</sup> below that amount were subsidized so that each mill (0.1 percent tax) levied raised \$102.50 per pupil. In addition, these districts received a foundation grant of \$400 per pupil. Districts with SEV per pupil greater than this had their foundation grants taxed away until exhausted.<sup>8</sup> Therefore, basic per pupil state aid for district  $i$  with state equalized valuation per pupil  $V_i$  was given by:  $A_i = \text{Max} [0, \$400 + \text{mills}_i \times (\$102,500 - V_i)]$ . In

---

<sup>6</sup> The state had moved from a modified foundation program to the district power equalization program in 1973.

<sup>7</sup> SEV is constitutionally set at one-half of market value, but in practice tends to be slightly less than that.

<sup>8</sup> For these high wealth districts, categorical aid was also reduced by a percentage that varied directly with the yield from the local operating levy.

1994, 34.2 percent of districts were off formula.<sup>9</sup> The median implicit price of raising an additional \$1 across all on-formula districts was \$0.70, ranging from a minimum of \$0.32 to a maximum of \$1.10. The price exceeded \$1-for-\$1 for the 3.4 percent of districts subject to recapture on the margin.

To provide a back-of-the-envelope sense of how equalizing this system would be expected to be, we can compare the likely price and income effects. In order to readily account for both the direct effect of higher resources and the indirect effect through the effective price, we treat property wealth as equivalent to income. Median SEV per pupil was \$85,629 for on-formula districts and \$177,481 for off-formula districts. The ratio between SEV per pupil in the high wealth relative to the low wealth communities is 2.08. The ratio of median prices is 1.43. We can combine these with reasonable estimates of price and income elasticities to predict, holding all else equal, how much more the median off-formula district would spend per pupil than the median on-formula district. Using -0.25 for the price elasticity and 0.6 for the income elasticity, spending by the median high wealth district would be predicted to be 1.4 times as high. In 1994, the actual ratio between median current operating expenditures per pupil across the two types of districts was 1.25.<sup>10</sup>

Figure 5 plots district per pupil revenues in 1994 – including all local funds, unrestricted state funds from the power equalization mechanism and those state categorical grants which were later included in the foundation program under the new system – by SEV. The positive correlation between revenues and wealth is evident. From a regression of per-pupil revenues on per-pupil property wealth and a constant term, each additional \$10,000 of SEV per pupil increased district revenues by an average of approximately \$90 (2001 dollars). This may overstate the tie between effective resources and wealth if educational costs are higher in high wealth districts. Courant, Gramlich and Loeb (1995) found that correcting for a subset of cost factors lowered the estimated coefficient on wealth by between 12 and 23 percent, depending on the specification; though, in all cases, the relationship remained highly statistically significant.

### **3. Policy change through the passage of Proposal A**

While there was dissatisfaction with the power-equalization plan, the real driving force behind school finance reform was the property tax. In 1993, the Michigan property tax burden was seventh highest across the states (U.S. Bureau of Census); 61.4 percent of total local school revenues (including debt) came from local property taxes, compared to a national average of 44.7 percent (*Digest of Education Statistics* Table 155, 1995). Michigan property taxes as a share of personal income had risen from 4.3 percent in 1978 to 5.0 percent in 1991, while the national trend was one of reduced dependence on property taxes. There were many indications of dissatisfaction with the property tax. Eight referenda to reduce property taxes were held between 1972 and 1993, though all failed (Knittel and Haas, 1998). Governor John Engler, who was elected in 1990, made a 20 percent reduction in property taxes one of his campaign promises.

---

<sup>9</sup> These calculations are based on data from the Michigan Department of Education Bulletin 1014, as are all of the calculations requiring district-level financial data.

<sup>10</sup> The difference between the actual and the predicted may be partly due to district SEV being a noisy proxy for resident income, as well as to any systematic differences between on- and off-formula districts other than wealth, such as the differences in costs described below.

On July 20, 1993, the state senate was debating Governor Engler’s latest proposal to reduce property taxes. Senator Debbie Stabenow proposed an amendment to entirely eliminate the property tax as a source of local school finance, a move widely interpreted as an attempt to show how impractical it was to cut taxes without specifying new revenues for schools. Surprisingly, the senate passed the amended bill the same day, the house followed a day later, and the governor signed the bill. With little debate the state had eliminated \$6.5 billion in school taxes for the 1994-1995 school year. It took until March 1994 for the legislature and governor to present voters with two alternatives for the mix of revenues to be used to replace the local property tax, Proposal A and a “statutory plan” that would have been implemented had Proposal A failed. Proposal A primarily called for increases in the state sales tax, while the other plan would have increased state income taxes. Though the revenue sources differed, both plans would have centralized school finance decisions and increased spending per pupil in previously low-spending districts. Proposal A passed by a 2 to 1 margin, carrying all 81 counties in the state (Courant and Loeb, 1997).

**Table 1: Revenue Sources for K-12 Education Before and After Reform**

<b>Tax</b>	<b>Prior to Reform</b>	<b>Proposal A</b>
Sales Tax	60% of proceeds from the 4% rate	60% from the 4% rate and 100% from the 2 percentage point increase
Use Tax		All revenue from the 2 percentage point increase
Income Tax		14.4% of collections from the 4.4% rate (down from 4.6%)
Real Estate Transfer Tax		All revenue from the 0.75% tax
Cigarette Tax (per pack)	\$0.02 of the \$0.25 tax	63.4% of proceeds from the \$0.75 tax
Other Tobacco Products		Proceeds of the 16% tax (on wholesale price)
Liquor Excise Tax	Revenue from the 4% tax	Revenue from the 4% tax
Lottery	Net revenue	Net revenue
State Tax on All Property		6 mills
Local Homestead Property Tax	34 mills (average)	0
Local Nonhomestead Property Tax	34 mills (average)	18 mills

Source: Adapted from Michigan House and Senate Fiscal Agencies (1994) Tables 1 and 2.

As shown in Table 1, Proposal A fundamentally changed the system of taxation that raised revenues for schools, altering the local share of taxes, the types of taxes used and the incidence of taxation.<sup>11</sup> Under Proposal A, earmarked revenues are deposited into the School Aid Fund to

<sup>11</sup> In addition to changing the relative importance of different taxes, Proposal A cut taxes overall. Local property taxes decreased by \$5,258 million following reform, though this was partially offset by a \$1,258 million increase from the state property tax (Courant and Loeb, 1997). The sales tax increase added approximately \$2,217 in

finance state education aid to districts. The two percentage point increase in the sales and use tax, the 50 per cent per pack increase in the cigarette tax, the 0.75 percent real estate transfer tax, and 14.4 percent of individual income tax revenues (increased to 23.0 percent in 1997) are all directly deposited to this fund. Also included is a new statewide uniform property tax levy of 6 mills on both homestead and non-homestead property. Districts are required to levy 18 mills on non-homestead property for full participation in the state school finance program,<sup>12</sup> and most districts are not allowed to levy additional mills to finance general operating expenditures. Average levies on both types of property were 34 mills before the reform, so these provisions represent significant property tax relief. With the dramatic centralization of finance, the state share of general funds rose from 31.3 percent in 1993 to 77.5 percent by 1997. Figure 6 shows the dramatic drop in the percent of public school revenues coming from local sources. This actually understates the change in the state role since the local property tax levy is essentially state-controlled.

Proposal A also eliminated the power-equalization program and replaced it with a modified foundation grant program. States that implement a foundation plan choose a foundation level per pupil and a required local property tax rate (see Yinger (this volume) for a more thorough discussion). Local districts receive the difference between what is raised with the required levy and the total foundation amount. Foundation plans differ in two important aspects. First, districts may or may not be allowed to levy additional local taxes to supplement the foundation level. Second, districts that raise more than the foundation level with the required local property tax rate may or may not be required to return the excess revenue to the state, though recapture of this form is uncommon. While Michigan's system does not have recapture, it caps revenues in previously high-spending districts based on 1994 revenue levels. The system then improves equity primarily by creating a spending floor that levels spending up in other districts. The required local contribution is the amount raised by the 18-mill levy on non-homestead property.

During the first year of reform, 1995, districts were divided into three groups according to the way the district-specific spending limits and foundation grants are calculated. For the lowest spending districts, those spending less than \$3950 per pupil in 1994, the foundation allowance was set at \$4200 for 1995.<sup>13</sup> Those districts spending between \$3950 and \$6500 in 1994 received foundation allowances of \$160 to \$250 more than their prior year spending, with the increase based on a sliding scale and inversely related to prior spending. The limit for districts spending above \$6500 was set at \$160 above their 1994 spending level. The foundation grant, financed by the state uniform and the local non-homestead property taxes, was capped at \$6500. Districts with allowances above the maximum grant are allowed to raise additional funds through local property taxes on homestead property, known as "hold-harmless mills."

While the lowest spending districts were moved up to \$4200 in the first year, the goal was to slowly increase these lowest spending districts up to a basic foundation level, equal to \$5000 in

---

revenues. Overall, state taxes fell by \$844 million. However, the federal government took some of this tax break since sales tax expenditures cannot be deducted from the federal income tax, while property tax expenditures can. Courant and Loeb (1997) estimate this cost to tax payers at \$429 million.

<sup>12</sup> A grandfather clause allows 13 (of the 524) K-12 districts that levied less than 18 mills prior to the reform to levy their previous millage rate.

<sup>13</sup> Revenue eligible to be counted in the base consisted of local school operating property tax revenue, state aid payments for formula aid and categorical programs that were "rolled up" into the foundation allowance.

1995. Those districts receiving less than the basic foundation would see larger annual increases. Districts with revenues at or above the basic foundation, which would include all districts by 2000, would all receive the same annual increases. Thus, most of the nominal disparities in revenues at the time the system is fully phased in are held fixed by the system. Over time, continued equalization occurs as the value of the nominal differences between districts decreases.

The basic foundation level increases automatically each year by the ratio of current earmarked State Aid fund revenues to 1995 revenues. In 2002, every district has a foundation grant of at least \$6300. The maximum foundation grant is \$7800, and there are 45 districts with foundation allowances over \$7800 (ranging from \$7810 to \$15,187). Table 2 shows the foundation levels for each year since the implementation of Proposal A. Annual funding increases have been below the inflation rate in the districts with the highest foundation allowances. Two thirds of these districts are in Southeast Michigan in the Detroit Area. Note that charter schools (academies) have an alternative foundation level, discussed in more detail below.

**Table 2: Foundation Levels**

	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Minimum	4200	4506	4816	5124	5170	5700	6000	6300	6700
Basic Foundation	5000	5153	5308	5462	5462	5700	6000	6300	6700
Academies, Maximum	5500	5653	5808	5962	5962	6200	6500	6800	7000
Hold Harmless, Maximum	6500	6653	6808	6962	6962	7200	7500	7800	8000

Note: The hold harmless maximum is \$1500 above the basic foundation through fiscal year 2002, and then \$1300 above after that. Source: Michigan Department of Education web page.

Figure 7 shows clearly how equalization through Michigan's basic aid formula operates. The distribution of the foundation allowance is shown for 1995, 1998, and 2001. Both the steady increase at the bottom of the distribution and the stability at the top are evident.

In addition to the dramatic changes in the basic aid program, Michigan's system of categorical grants was revamped. More than 30 of the existing categorical grants, including contributions to teacher retirement, were eliminated and incorporated in the foundation allowance. Between 1994 and 1995, the share of state operating aid distributed through separate categorical grants fell from more than 40% to approximately 15%. This is important since categorical funding is the only mechanism in place to account for differences in costs or resource needs across districts once most are pushed up to the basic foundation level. Other states with foundation systems tend to also rely on differential pupil weighting or district-specific adjustments to foundation levels.

Appropriately accounting for differences in need, regardless of the method, is not straightforward. The difficulty arises because when two districts are observed with the same expenditures but different student outcomes, it is unclear whether the outcome differences result from differences in costs, in goals, or in efficiency. Because of this ambiguity, providing additional funds to districts that demonstrate higher need may lead to perverse behavior. For example, if a larger special education program is viewed to increase district costs, then districts may classify slow-learning students as disabled in order to appear more needy (Cullen,

forthcoming). Reliable measures of underlying need are based on characteristics that are not directly within the control of the school district.

Michigan's categorical grant program is subject to these design issues. One of the largest remaining categorical grant programs is for special education (about \$400 million in 2001).<sup>14</sup> Though some special education funds are allocated through two smaller funds for low-incidence disabilities and regional service area support, most are allocated based on actual special education expenditures. The majority of local special education expenditures are reimbursed at a rate of 28.6 percent (*Durant v. State of Michigan*). The danger with this form of reimbursement is that it weakens incentives for cost containment and may lead districts to excessively classify students as disabled so that instructional spending qualifies for reimbursement. The advantage is that it partially insures districts against the risk of serving a high-cost population.

The other dominant categorical grant program (\$304 million in 2001) is for "at risk" students, defined by income. The allocation is 11.5 percent of the foundation allowance multiplied by the number of free-lunch eligible students.<sup>15</sup> There are also categorical grants for early education, bilingual education, gifted education, and vocational education. There are no categorical programs to help districts with capital improvements.

#### **4. Changes in tax burdens**

In shifting from local to state taxes, Michigan shifted away from the property tax toward the sales tax. Relative to other states, Michigan relied more heavily on property taxes and less heavily on sales taxes. Property taxes were 33 percent higher per capita than the national average, and sales taxes were 30 percent lower.<sup>16</sup> Both taxes are now much closer to the national averages.

Taxes can be compared along a number of dimensions including equity, stability and the extent to which they alter taxpayer behavior. The primary concern with the property tax was that it was inequitable, in part because property tax rates vary substantially across districts and in part because the tax is perceived as being regressive. The wide range of property tax rates across the state was evident. The incidence of the property tax is less clear. Fullerton and Rogers (1993) find that housing consumption as a fraction of income is higher than average at the lowest income levels and then becomes approximately proportional to income. This is roughly consistent with other theoretical and empirical work (Ihlanfeldt, 1982). The elderly generally have higher property wealth for any given level of income and, as such, can be adversely impacted by the property tax. However, the Michigan property tax already had a circuit breaker to help low-income and elderly homeowners. Residents who were under 65 years old received a refundable tax credit of 65 percent of taxes paid in excess of 3.5 percent of income. Residents 65 years and older received a 100 percent tax credit for taxes in excess of 3.5 percent of income.

---

<sup>14</sup> The \$746 million that the state labels as special education aid includes the full amount of the foundation grant for each special needs student. However, this is really basic aid that has been relabeled since the state attributes the entire required local levy to the local share of the foundation grant for general education students.

<sup>15</sup> Prior to 2000, hold harmless districts were not eligible for this aid. More recently these districts do receive aid, but at a lower rate of 5.75 percent.

<sup>16</sup> "Income, Spending, and Taxation- Michigan Compared to the U.S. Average," Council Comments, No. 997, Detroit: Citizens Research Council of Michigan, April 1991.

Credits were capped at \$1200 and phased out for incomes over \$73,000 a year. Renters were allowed to claim 17 percent of their rent as property taxes.

The sales tax is regressive with respect to current income and approximately proportional with respect to lifetime income (Slemrod and Bakija, 1996; Fullerton and Rogers, 1993). The burden of the sales tax on low-income residents is alleviated by the exclusion of food (Blume, 1982). Because of the similar incidence of the two taxes, Proposal A should not have caused a substantial shift in tax burden except for two important aspects of the reform.<sup>17</sup> First, sales taxes increased to the same extent for renters and homeowners. However, the drop in the property tax on homestead property was much greater than that on non-homestead property. Thus, even if property tax payments are fully shifted to renters, the decrease in rent would be less than proportional to the decrease in property taxes for homeowners. Thus, renters pay an increased share of taxes as a result of the reforms, and more so the less changes in property taxes are reflected in rents. Second, the shift from the local to the state level and the uniform tax rates applied across the state altered the tax burden by geography; those districts with the highest property tax rates saw the biggest drops in tax burdens.

Relative reductions in tax burdens could have a secondary impact on incidence by increasing property values. Guilfoyle (1998) measures the capitalization of interjurisdictional differences in property taxes and school spending using Proposal A as a natural experiment. Using individual home sales data, he finds that a \$1 tax differential leads to a \$5.20 home value differential. He also finds significant effects of spending (\$100 increase in per pupil spending would raise home values 0.4 to 0.6 percent). These estimates imply that if a community were to raise spending through property taxation, the effects would come close to canceling one another. Since both the tax cuts and spending increases due to Proposition A were partially capitalized into home prices, districts with low spending and high property tax rates before the reform would particularly benefit. Capitalization, thus, is likely to have enhanced the equalization in revenues directly attributable to the change in school finance.

## **5. Changes in patterns of expenditures**

Total revenues increased in Michigan from a district average of \$5717 per pupil in 1991 to \$7231 per pupil in 2000 (2001 constant dollars). Figure 8 plots the changes over the last decade, highlighting the large jump between 1994 and 1995. Revenues across districts also became more equal in the 1990s. The coefficient of variation, the standard deviation divided by the mean, dropped from 0.22 in 1991 to 0.13 in 2000 (Figure 8). Those districts with the highest initial total revenues experienced the least growth during the decade. The average growth for the districts in the upper decile in 1991 was only six percent, while that for the lowest decile was 46.9 percent.<sup>18</sup>

---

<sup>17</sup> A third potential effect is a shift towards or away from taxes on business depending upon the relative burden born by business under property and sales taxes.

<sup>18</sup> This is in keeping with Prince (1996) who finds that revenues in the lowest revenue districts increased by 30 percent between 1994 and 1997 while those in the highest revenue districts declined by four percent in real terms.



**Table 3. Patterns in revenues and expenditures by year and quintile.**  
 [Percent change in revenues from the prior year reported in brackets]

	1994	1995	1996	1997	1998	1999	2000
<b>Per pupil foundation allowance</b>							
Quintile 1	-	5017	5213 [0.039]	5429 [0.042]	5668 [0.044]	5540 [-0.023]	5851 [0.056]
Quintile 2	-	5392	5530 [0.026]	5698 [0.031]	5888 [0.033]	5737 [-0.026]	5851 [0.020]
Quintile 3	-	5708	5777 [0.012]	5868 [0.016]	5967 [0.016]	5809 [-0.026]	5859 [0.009]
Quintile 4	-	6217	6208 [-0.001]	6249 [0.007]	6325 [0.012]	6163 [-0.026]	6201 [0.006]
Quintile 5	-	7879	7822 [-0.007]	7828 [0.001]	7881 [0.007]	7679 [-0.026]	7668 [-0.001]
Range	-	7279	6893	6577	6313	6102	5598
75-25%ile	-	1044	881	739	612	596	480
<b>Current operating expenditures per pupil</b>							
Quintile 1	4845 [0.057]	5242 [0.086]	5424 [0.034]	5642 [0.042]	5745 [0.020]	5908 [0.029]	6197 [0.049]
Quintile 2	5159 [0.070]	5575 [0.082]	5693 [0.023]	5911 [0.039]	5997 [0.015]	6153 [0.027]	6284 [0.022]
Quintile 3	5371 [0.064]	5834 [0.087]	5942 [0.019]	6103 [0.028]	6086 [-0.002]	6158 [0.012]	6287 [0.022]
Quintile 4	5998 [0.064]	6398 [0.069]	6497 [0.016]	6678 [0.029]	6645 [-0.004]	6753 [0.016]	6855 [0.020]
Quintile 5	7500 [0.044]	7747 [0.038]	7858 [0.016]	7981 [0.017]	7992 [0.001]	8027 [0.008]	8194 [0.022]
Range	8555	6895	7074	7182	9664	6226	6271
75-25%ile	1192	1169	1083	1090	990	952	963

Table 3 provides more detail by tracking changes in the foundation allowance and in current operating expenditures for districts in different quintiles based on their revenues prior to the reform. Real growth in both the foundation levels and expenditures are evident for most, though not all, years. The lowest spending districts, quintile 1, have consistently seen the greatest increases in foundation levels and the range in foundations has decreased from \$7,279 in 1995 to \$5598 in 2000. Note that the interquartile range (\$480 in 2000) is much smaller than the range, indicating that the distribution has long tails. Figure 9 plots the 1994 base foundation and the 2000 foundation level. The clustering at the floor of just under \$6000 clearly demonstrates the leveling up that has taken place at the bottom of the distribution. The sloped section falls below the 45 degree line since foundation levels fell slightly in real terms for higher wealth districts. Still, districts with higher base levels had higher foundation levels six years later.

Differences in current operating expenditures have also decreased over time. Figure 10 plots the 1994 and 2000 levels. Again the growth at the upper end does not appear as great as the growth at the lower end. The interquartile range was \$1,192 in 1994 and \$963 in 2000. However, the changes over time follow a less consistent pattern than for foundation revenues. This is because many of the districts receiving increasing categorical grants are in middle of the distribution, not at the low end (see below).

The revenue gains vary according to demographic characteristics of the districts as well. Table 4 shows the correlations between percent gains in total revenues from 1991 to 2000 and demographic characteristics of districts from the 1990 Census School District Data Book. Many of the expected relationships are evident. Districts with lower income per capita, lower state equalized property values for both homestead and non-homestead property, and higher poverty rates had greater gains in total revenues. However, gains were lower in districts with high proportions of black and Hispanic students.

**Table 4: Correlations Between Revenue Gains in the 1990s and District Demographics**

	Rev. Gain	% Rev Gain	Income Per Cap	Hmstd SEV	Non-Hm SEV	% Urban	% Poor	% Black/Hispanic
Revenue Gain	1.00							
% Rev Increase	0.95*	1.00						
Inc Per Cap	-0.46*	-0.51*	1.00					
Hmstd SEV	-0.43*	-0.48*	0.43*	1.00				
Non-Hm SEV	-0.26*	-0.30*	-0.008	0.37*	1.00			
% Urban	-0.23*	-0.34*	0.47*	0.057	-0.046	1.00		
% Poor	0.48*	0.46*	-0.66*	-0.26*	-0.075	-0.15*	1.00	
% Black/Hisp	0.15*	0.027	-0.11*	-0.18	-0.03	0.37	0.47	1.00

Note: \* indicates correlation is significant at the 1% level.

An important question is how the urban centers fared under reform. On average, the gains in urban districts were lower (20.0 percent over the decade) relative to other districts (31.3 percent). However, most of the large inner-city districts did see substantial gains. Detroit's revenues rose by 35.2 percent; Flint's by 41.2 percent; and Lansing's by 35.3 percent. Grand Rapids' revenues rose by 19.6 percent, which was also the average increase of other urban districts. Figure 11 shows the relative percentile rank of these cities' school districts in the distribution of local and state revenues across districts. The drop over time indicates that, for all but Grand Rapids, these cities improved in terms of relative position over the 1990s. Interestingly, none of these city districts were in the group of districts that received the largest increases in foundation allowances. For example, Detroit's 1994 revenue that served as the base for the foundation grants was \$5377. By 2001, the foundation in Detroit was \$6584 while the average total revenue was \$8842. The increased revenue largely came from increases in categorical revenues directed to poor and low-performing students through the large compensatory education program. Revenues from categorical grants generally come with restrictions and thus these additional funds may not be as valuable to districts as unrestricted revenues.

So far, we have ignored differences in costs that may affect the distribution of effective resources per pupil across districts. We apply two cost adjustments to explore the extent to which the foundation program alone and the program including categorical aid target more funds to higher cost districts. Recall that the foundation allowance system essentially treats prior spending as a measure of resource need, while the categorical programs incorporate student poverty and special needs status. The first cost adjustment that we use is a district-specific index of local nonpersonnel and personnel costs developed from a hedonic wage model that isolates the impact of regional amenities and costs of living (Chambers, 1998). The second borrows estimates from Duncombe et al. (1996) based on an analysis of New York state to incorporate differences in student characteristics that affect the costs of achieving given student performance outcomes.<sup>19</sup> While the geographic index ranges from 0.80 to 1.19, the more comprehensive index ranges from 0.724 to 1.77.

Table 5 shows the coefficient of variation for three different district spending variables in 2000. The first assigns all districts the state average foundation allowance in that year. The other two measures are the actual district foundation allowances and operating expenditures per pupil. This is a year when variation in foundation allowances is restricted to the top 2/5 of districts and all other districts are at the minimum level.

**Table 5: Accounting for Differences in Cost Factors**

	No Cost Adjustment	Geographic Cost Adjustment	Also Accounting for Student Char.
State Average Allowance	0	0.078	0.116
Own Foundation Allowance	0.138	0.142	0.173
Own Operating Expenditures	0.151	0.158	0.167

Moving from row 2 to row 3 without any cost adjustment leads to an increase in measured inequality. This means that categorical aid is not targeted to those districts with the lowest foundation allowances. This remains true when geographic costs are accounted for, but categorical aid actually reduces the disparity in effective resources relative to the foundation program alone once differences in student characteristics are also incorporated. This is not surprising since categorical aid is explicitly targeted to two costly-to-educate populations-- poor students and students with disabilities. What is surprising is that a system of equal per pupil funding appears to distribute resources more equitably than either the foundation system alone or the combined foundation and categorical programs. Also, the fact that successive adjustments lead to larger coefficients of variation for both foundation allowances and operating expenditures implies that ignoring cost differences exaggerates the degree of effective equalization of resources. Therefore, any impact of the reform on student outcomes would be expected to be somewhat muted relative to the impact on unadjusted spending.

<sup>19</sup> Specifically, we use the coefficients on three demographic variables from Model I in Table 10-1 and the actual values for districts in Michigan to predict the percentage increase in spending relative to a baseline (e.g.  $1 + 0.8306 \times \text{percent in poverty} + 2.1166 \times \text{percent in female-headed households} + 0.3903 \times \text{percent of disabled students}$ ). We then create an index by normalizing the predicted values by the average across all districts and multiplying by the geographic cost index (which has also been normalized to equal one on average).

## 6. Proposal A and Student Outcomes

An important policy question is whether the sharp changes in the level and distribution of funds associated with Proposal A translate into changes in outcomes. Evidence from other states' reforms does not reveal a close relationship between spending and outcomes. For example, Downes (1992) found that the nearly complete equalization of revenues in California after Proposition 13 did not significantly equalize student outcomes. In practice, however, California's reform achieved equalization by leveling down spending in previously high-spending districts. The effects of Michigan's reform could differ since it operated primarily by leveling-up resources.

Michigan has consistently reported student math scores (a three level measure of "low", "moderate" or "satisfactory") for fourth and seventh grade students since 1990-91.<sup>20</sup> We use the student-level data to create yearly district measures for the percent of students passing (defined as not receiving a "low" score) and the percent gaining the highest mark of "satisfactory." Figure 12a shows that there has been an increase in both the average district pass rate and the average district satisfactory rate on this exam over the last decade. In addition, as shown in Figure 12b, the coefficient of variation on all three of these measures has decreased substantially. However part of the reason for the drop in variation in scores is due to an important ceiling effect, not only on the pass rate but also on the satisfactory rate. Figure 12c plots the change in district pass rates from 1991 to 2000 by the 1991 score. Because the initial rate plus the change cannot sum to more than 100, there is a clear break in the distribution of gains. The ceiling effect for the satisfactory score is not quite as strong as for the pass rate, but is still evident. Thus, when looking at the impact of the change in expenditures on student outcomes it is important to take account of starting levels. We cannot expect districts with pass rates close to the ceiling at the beginning of the period to gain as much as districts with low pass rates.

A univariate regression of the change in the fourth grade pass rate on the percentage change in total expenditures indicates that a ten percent increase in expenditures is associated with an approximately 1.5 percentage point increase in the pass rate ( $p < .001$ ). This is illustrated by Figure 12d. However, if the initial pass rate is included as a control variable, the relationship between the change in fourth grade pass rates and the change in expenditures falls to a 0.001 percentage point increase in the pass rate for a ten percent increase in expenditures (essentially zero) and is no longer statistically significant ( $p = .995$ ). The same results hold for the seventh grade scores. Without the control for initial level, a ten percent increase in expenditures coincides with a 0.7 percentage point increase in the pass rate ( $p = .002$ ); but when the initial score is controlled for the increase becomes 0.17 ( $p = .452$ ).<sup>21</sup>

These models are clearly limited and may suffer from omitted variables bias. Papke (2001) uses alternative methods and does find a positive and statistically significant relationship between increased spending and student outcomes as a result of Proposal A in a number of specifications;

---

<sup>20</sup> Michigan also reports scores for reading in fourth and seventh grade and writing, science, and social studies in fifth and eighth grades, but the scoring has not been consistent over the reform period.

<sup>21</sup> Similarly, a ten percent increase in expenditures is associated with a 1.0 percentage point ( $p = .001$ ) increase in satisfactory rates in the fourth grade without the control for prior outcomes, and a 0.2 percentage point decrease ( $p = .34$ ) with the control. The numbers for seventh grade satisfactory rates are 0.2 ( $p = .47$ ) and  $-0.4$  ( $p = 0.10$ ), respectively.

however, not when lagged scores are included in the model. If initial scores and changes in expenditures are highly correlated then it may simply be too difficult to parse out the effect of expenditures on gains. Figure 12e shows that there is variation in resource changes for each level of initial math score, though the correlations are -0.3 between the percent change in expenditure and each of the initial student outcome measures (fourth and seventh grade pass and satisfactory rates). This is clear evidence that more resources were targeted to districts that were more likely to improve on test pass rate measures even in the absence of reform.

## **7. School Choice and Accountability Reforms**

In addition to the changes in raising and delivering funds to school districts, Proposal A also included new school choice measures and led to a new accountability system. It is likely inevitable that such dramatic increases in the state role in education are accompanied by increased state oversight and involvement. The two non-financial school initiatives can be viewed as complimentary policy tools for encouraging the effective and efficient use of funds.

Proposal A expanded school choice in Michigan by allowing students to opt to attend public school academies (PSAs), known more widely as charter schools. PSAs are financed by state allocations based on the same per-pupil foundation formula that applies to other public schools, though charter schools do not have access to local revenue bases and have no required contribution. If a charter school is authorized by another school district, the charter school receives the minimum of the district's per-pupil foundation allowance or the state basic allowance plus \$500 (see Table 2). Since state per pupil foundation aid follows students, it is presumed that schools will compete to attract students. However, entry has only been fostered at the elementary level since per pupil expenditures are higher than the average for grades K-12 at the secondary level. There are no provisions for sources of capital funds, so that site availability is a strong determinant of entry as well.

Only a few charter schools had started up by two years following reform but since then the numbers have steadily increased: 78 in 1997, 108 in 1998, 138 in 1999, 171 in 2000, 184 in 2001. Despite the rapid growth in numbers of schools, only a small minority (1 percent) of students statewide attends PSAs. Unlike in other states, charter schools have tended to locate in more urban and disadvantaged areas and, for this reason, tend to have low average test scores. However, in a cross-cohort analysis, Bettinger (2002) does not find much evidence that these schools improve student achievement even after accounting for initial student ability. Nor does he find that nearby public schools are improving in response to competitive pressure from charter schools.

Options for choice have been further expanded through "schools of choice" legislation that allows students to attend public schools outside their home district. Under this program, a receiving district receives the minimum of its own and the sending district's per pupil state foundation aid. A district does not have to accept transfer students, but if it does, it must admit students through a lottery if oversubscribed. Since operating revenues are now so closely tied to enrollment and there is little local leeway, traditional public schools have realized that transfer students provide an opportunity to expand their budgets. By 2001, four out of every five school districts had signed on to participate. Between 1997 and 2001, the number of students

participating grew from 7,836 to 33,506. Schools of choice have largely been Detroit phenomena, with more than 1/3 of all transfers taking place within the metro area, though there are other pockets of activity across Michigan as well. Metro districts that are losing students have been responding through marketing campaigns and reportedly by adding free full-day kindergarten.<sup>22</sup> Some schools have been forced to close.<sup>23</sup> Where schools are aggressively competing for students, open enrollment has clearly had a tangible impact.

Michigan has also made changes to its school-level accountability system and has introduced an award system for both staff and students. Since 1993, the state had a three-tiered accreditation system with such a broad middle tier that it did not distinguish between successful and failing schools. The ineffectual system was replaced with a new performance-based accreditation system in May of 1999. However, when the State Board moved to implement the plan in the Spring of 2001, more than 600 schools (1 in 5) were expected to lose accreditation, including nearly 40% of metro Detroit high schools.<sup>24</sup> Due to public backlash, the system was never implemented. School officials complained that the emphasis on test score levels did a better job of measuring student disadvantage than school effectiveness.

With additional impetus from Bush's "No Child Left Behind" bill, the State Board approved the Education Yes! Accreditation System in March, 2002. Under this system, schools receive letter grades of A, B, C, D-Alert, or Unaccredited. Schools not only receive an overall composite grade, but are also individually graded in six separate sub-areas: achievement level, change, and growth, as well as indicators of community engagement, instructional quality, and learning opportunities. Attendance and dropout rates are included among the student performance indicators to allay concerns about an overemphasis on test scores. The comprehensiveness of this new program promises to better measure what schools actually do.

Good performance is rewarded at two levels. Since 2000, elementary schools that demonstrate sustained improvement on the achievement exams have been eligible for Golden Apple Awards. These are financial awards of \$10,000 for use by the principal plus \$1000 for each full time employee. Also, since 1999, high-achieving high school graduates are eligible to receive a \$2500 scholarship to attend an in-state college (and \$1000 to attend an out-of-state college) through the Michigan Merit Award Scholarship Program. A concern about this program is that it subsidizes students from more advantaged families because of the strong tie between family background and academic achievement. While 34% of eligible white students qualified in the first year, only 20% of Hispanics and 7% of black students did.<sup>25</sup> It is too early to judge whether these incentive programs have affected staff and/or student effort.<sup>26</sup>

---

<sup>22</sup> "Detroit pulls out stops to enroll pupils," *The Detroit News*, August 23, 2001.

<sup>23</sup> "Choice plan shifts funds for schools," *The Detroit News*, December 2, 2001.

<sup>24</sup> "State flunks 600 schools," *Detroit News*, April 11, 2001. "Accreditation threatened," *Detroit News*, May 7, 2001.

<sup>25</sup> "Merit Test is Biased, ACLU says," *Detroit News*, June 28, 2000.

<sup>26</sup> Accountability grants may be leading to perverse behavior. Given that significant funds are redirected based on the high-stakes exams through both direct payments from the state and indirect student choice, it may not be surprising that 71 schools across 22 districts were involved in a cheating scandal in 2001.

## 8. Tensions and prospects for the future

School finance reform in Michigan has clearly equalized revenues across districts and increased the revenues of the lowest-spending districts. The reform may possibly also have improved student outcomes. However, the policy has also created a number of tensions, most the result of the reduced flexibility at the local level.

Prior to the reform, local districts had substantial control over the level of funding in their schools. Proposal A changed this, increasing funding in previously low spending districts and constraining revenues in previously high-spending districts. It is likely that given the option those districts with an influx of new monies would like to spend some of it on non-education goods, while those limited by the policy would like to use other resources for schools.

Districts constrained from below or above may find ways around the restrictions by changing spending on unconstrained budget areas. For example, previously low-spending districts in Michigan may have an incentive to mask capital and other public expenditures as school operating expenditures. Preliminary analysis suggests that low-demand districts were indeed less likely to raise additional revenues for capital in response to the influx of new operating revenues (Cullen and Loeb, 2002). Evidence from California support that districts subject to binding spending ceilings also engage in forms of fiscal substitution. Proposition 13 imposes strict limits on non-categorical program expenditures while exempting programs such as vocational and special education. Increased disparity in spending on these programs has apparently partly offset the reduced dispersion in general education spending per pupil (Brunner and Sonstelie, 1999). Private contributions to schools have also partially offset the equalization (Evans, Murray and Schwab, 2001).

Dissatisfied voters in high-demand districts in Michigan have also tried to get around the restrictions directly by changing the policy. For the three years immediately following Proposal A (1995-1997), districts had the option of levying up to three additional mills for operating expenditure.<sup>27</sup> This ended in the 1997-98 school year. Michigan then built equalization into the mechanism. Starting in 1997-98, intermediate school districts (ISDs) could levy up to three mills that would be distributed on a per pupil basis across the member districts. A majority vote is needed across the member districts in order to levy these mills. Because ISDs combine districts with varied demand and property wealth, only one has approved these additional mills. This policy has not successfully alleviated the constraints on districts that wish to spend more on education. A bill sponsored by state Representatives in the summer of 2001 called for a revision to the law that would allow districts to raise up to one mill for school operating costs with voter approval. However, that bill did not pass, due to fears that it would undermine the initial reform and be a gateway to rising property taxes and inequities.

Courant and Loeb (1997) noted that the loss of local control over spending should become increasingly noticeable over time. This prediction seems to be coming true. Three other issues are worth noting.

---

<sup>27</sup> Sixty-two of the 524 K-12 districts approved these mills for FY1996 (Prince 1996).

- First, the current school finance program does nothing to equalize capital (Theobald, 2002). When left to local jurisdictions, the distribution of capital is likely to look much like the distribution of operating expenditures. Districts with high demand for schooling and high ability to pay will have better facilities. The difficulty comes in designing an equitable system that does not penalize districts for investments already made. Tensions over capital expenditures are also evident in charter school finance. Because there is no provision for capital funds for charter schools and charter schools have no taxing authority, it is difficult for potential academies to raise the revenues needed for startup costs.

- Second, the system is difficult for districts that are losing enrollment (Theobald, 2002). When a district loses a student, its costs do not necessarily decrease by the average per pupil cost. Many costs are fixed, at least in the short run. Existing facilities need to be maintained; programs need to run while they are reorganized to fit the shrinking population.<sup>28</sup> Even year-to-year fluctuations can be difficult if fewer students than expected enroll, since teachers are hired on the basis of projected enrollment. This is especially true now that revenues are tied so directly to enrollment and there is so little local leeway.

The current program does attempt to mitigate the difficulties of changing district enrollment by basing part of district revenues on enrollment in February of the previous academic year and part on enrollment in September of the academic year in question. Prior to 2000, this split was 40 percent and 60 percent. In 2000, it change to 25 percent and 75 percent, and currently is 20 percent and 80 percent. The trend has moved away from adjusting for previous years enrollment, compounding the difficulties faced by districts with lower than expected enrollment.

Choice exacerbates these tensions by introducing further uncertainty into district budgets. Moreover, if students going to charter schools are lower cost than those remaining in traditional public schools, then district costs are reduced by less than their revenue loss. There is strong evidence that this is the case since new charter schools have concentrated in the lower grades. To address this, Horn and Miron (2000) recommend differentiated foundation grants based on average costs by grade level. In general, the implicit assumption that the marginal student (in this case the one who leaves the district) is as costly as the average student can create severe difficulties for districts. It may, in fact, preclude the public sector response to choice that is, in theory, the aspect of choice that will most improve education in the state.

- Third, the shift from local to state control means that school funding may be impacted by a variety of state issues. At the state level, K-12 education has to compete with many other funding areas. The state's revenue surpluses, substantial at the time of reform, were used up by 1997. In that year, there were concerns about reductions in other state budget areas because of the guaranteed funding commitments for K-12 (Harvey, 1995). The concern could easily go the other way. The 1994 legislation automated the yearly change in foundation levels based on the statewide revenues per pupil for taxes earmarked for the School Aid Fund. However, the legislature may feel pressure to adjust the funding structure, and even within the framework there is room for interpretation. Categorical programs, which are particularly important to districts

---

<sup>28</sup> "Kalkasa saved by funding law, but small district still has problems," The Detroit News, August 28, 2001.  
"Kalkasa schools still battling cash shortage," The Detroit News, 1995.



with disadvantaged student populations, may be most at risk since their levels are not tied to an index.

The State's ability to protect these categorical funds may be limited because an increasing share of its revenues are earmarked for particular programs and thus restricted in use. Figure 13 plots the proportion of total taxes and the proportion of total direct revenues that are restricted. Prior to 1991 the proportion of total revenue that was restricted was approximately 55 percent. In 1991 it increased to 61 percent where it remained until Proposal A. Since 1995, this percentage has climbed to 72 percent. The percent of total tax revenue that is restricted has followed a similar trend. The legislature has less flexibility within the current system as to how it allocates its revenues.

Moreover, school revenues are now intricately tied to the network of state revenue raising policies. Changes in any one of the state revenue instruments may reduce funds targeted to the School Aid Fund. Drake (2002) calculates that the series of changes made to the relevant revenue sources since the first year, such as increases in the income tax exemption level, have reduced revenues earmarked for schooling by roughly \$328 per pupil this year. School funding is now also more directly tied to economic conditions through the shift from the property to the sales tax. The instability of the sales tax combined with the indexing of the school aid formula to state taxes may become a problem for local districts that have no flexibility to raise additional funds.

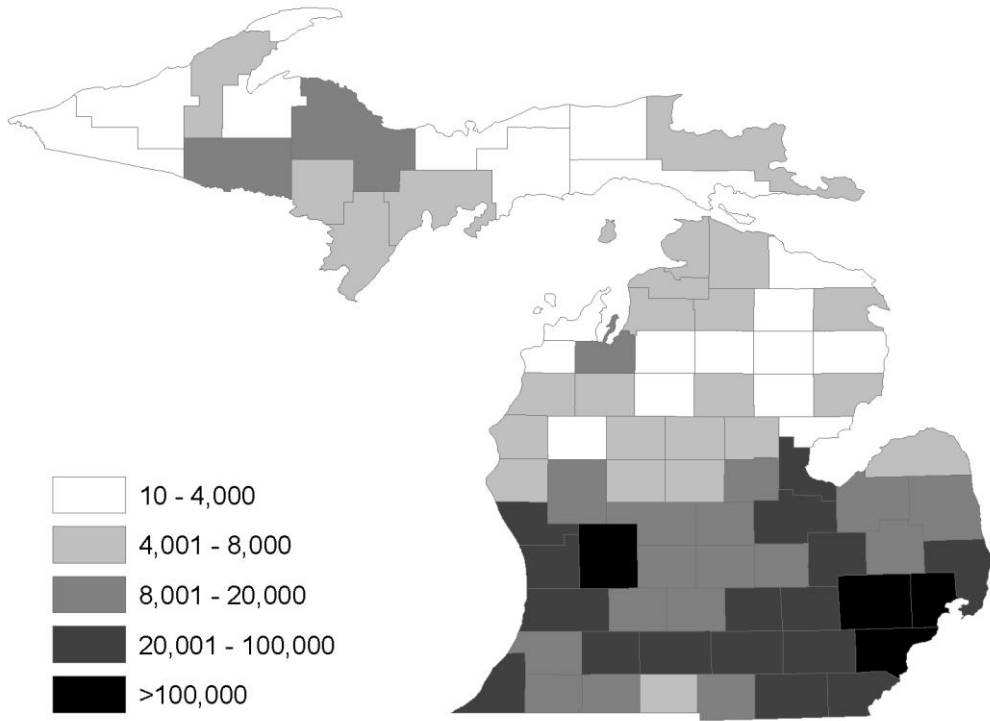
In conclusion, Proposal A was a radical shift along a number of dimensions. It equalized spending across districts by bringing up the lowest spending districts and essentially freezing the revenues of higher spending districts; it shifted funding responsibilities to the state level and constrained the revenue raising capacity of local jurisdictions; it decreased and equalized property tax rates and increased the sales tax; and it introduced school choice to Michigan in the form of charter schools and open enrollment. Each of these changes creates new challenges and opportunities. The tensions that have emerged most strongly so far are the dissatisfaction in high-demand districts that wish to increase their spending levels, and the financial difficulties in districts that lose enrollment because of the mechanical tie to revenues. It is not yet clear whether these problems will be solved through tinkering with the current system or whether they will lead to more systemic change.

## Bibliography

- Blume, Lawrence E. (1982). "The Sales and Use Taxes," in Harvey E. Brazer and Deborah S. Lauren (eds.) *Michigan's Fiscal and Economic Structure*, 595-618.
- Brunner, Eric and Jon Sonstelie (1996). "Coping with Serrano: Voluntary Contributions to California's Local Public Schools," *Proceedings of the 89<sup>th</sup> Annual Conference on Taxation*, 372-381.
- Chambers, Jay (1998). *Geographic Variation in the Prices of Public School Inputs*. Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, Working Paper #98-04.
- Courant, Paul and Susanna Loeb (1997). "Centralization of School Finance in Michigan," *Journal of Policy Analysis and Management* 16(1), 114-136.
- Courant, Paul N., Edward Gramlich and Susanna Loeb (1995), "A Report on School Finance and Educational Reform in Michigan," in T.A. Downs and W.A. Testa (eds.). *Midwest Approaches to School Reform*, Federal Reserve Bank of Chicago, 5-33.
- Cullen, Julie Berry (forthcoming). "The Impact of Fiscal Incentives on Student Disability Rates," *Journal of Public Economics*.
- Cullen, Julie Berry and Susanna Loeb (2002). "Fiscal Substitution in the Context of School Finance Equalization," Working Paper.
- Downes, T.A. (1992). "Evaluating the Impact of School Finance Reform on the Provision of Public Education: The California Case," *National Tax Journal* 45, 405-419.
- Drake, Douglas C. (2002). *A Review and Analysis of Michigan Tax Policies Impacting K-12 Finances*. Michigan Associations of School Administrators, School Business Officials, and School Boards.
- Duncombe, W., J. Ruggiero, and J. Yinger (1996). "Alternative approaches to measuring the cost of education," in H.F. Ladd (ed.), *Holding Schools Accountable: Performance-Based Reform in Education*. Brookings Institution.
- Evans, William N., Sheila E. Murray, and Robert M. Schwab (2001). "The Property Tax and Education Finance, Uneasy Compromises," in Wallace E. Oates (Ed.) *Property Taxation and Local Government Finance*, Lincoln Institute of Land Policy, Cambridge, Massachusetts.
- Fullerton, Don and Diane Lim Rogers (1993). *Who Bears the Lifetime Tax Burden* (Washington, DC: Brookings Institution).
- Guilfoyle, Jeffrey R. (1998). "The Effect of Property Taxes and School Spending on House Prices: Evidence from Michigan's Proposal A," Michigan Department of Treasury mimeo (February).
- Harvey, Lynn R. (1995). "1994 Michigan School Finance and Property Tax Reform," in *Increasing understanding of public problems and policies, 1994*, National Public Policy Education Conference.
- Horn, Jerry and Gary Miron (2000). *An Evaluation of the Michigan Charter School Initiative: Performance, Accountability, and Impact*. Western Michigan University, The Evaluation Center.
- Ihlanfeldt, Keith R. (1982). "Property Tax Incidence on Owner-Occupied Housing: Evidence from the Annual Housing Survey," *National Tax Journal* 35(1), 89-97.
- Kearney, C. Philip (2001). *Michigan School Finance*, October 10, 2001.

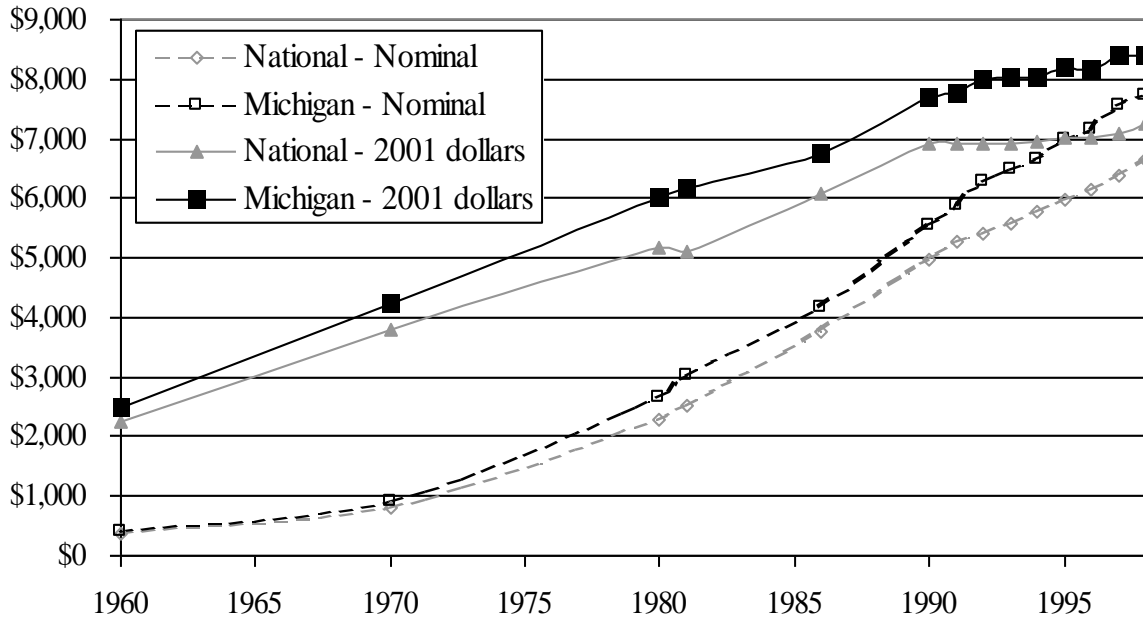
- Knittel, Matthew J. and Mark P. Haas (1998). *Proposal A: A Retrospective*, Michigan Department of Treasury Report (August).
- Michigan House and Senate Fiscal Agencies. Appendix A. The Michigan School Aid Act Compiled and Appendices. October 1994.
- Papke, Leslie E. (2001). "The Effects of Spending on School Inputs and Outputs: Evidence from Michigan," Working Paper.
- National Center for Education Statistics (1996). Public School Choice Programs 1993-94: Availability and Student Participation (NCES 97-909).
- Prince, Hank (1996). *Proposal A and Pupil Equity*. Michigan House Fiscal Agency Report. ([http://www.house.state.mi.us/hfa/prop\\_a.htm](http://www.house.state.mi.us/hfa/prop_a.htm)).
- Slemrod, Joel and Jon Bakija (1996). *Taxing Ourselves*. Cambridge, MA: MIT Press.
- U.S. Department of Education. Digest of Education Statistics 1995, 2000.
- U.S. Department of Education. National Center for Education Statistics. Geographic variations in public schools' costs. February 1998. Working Paper No. 98-04, by J. Chambers. Project offices, William J. Fowler. Washington, DC.

**Figure 1: Total Enrollment By County in Michigan**

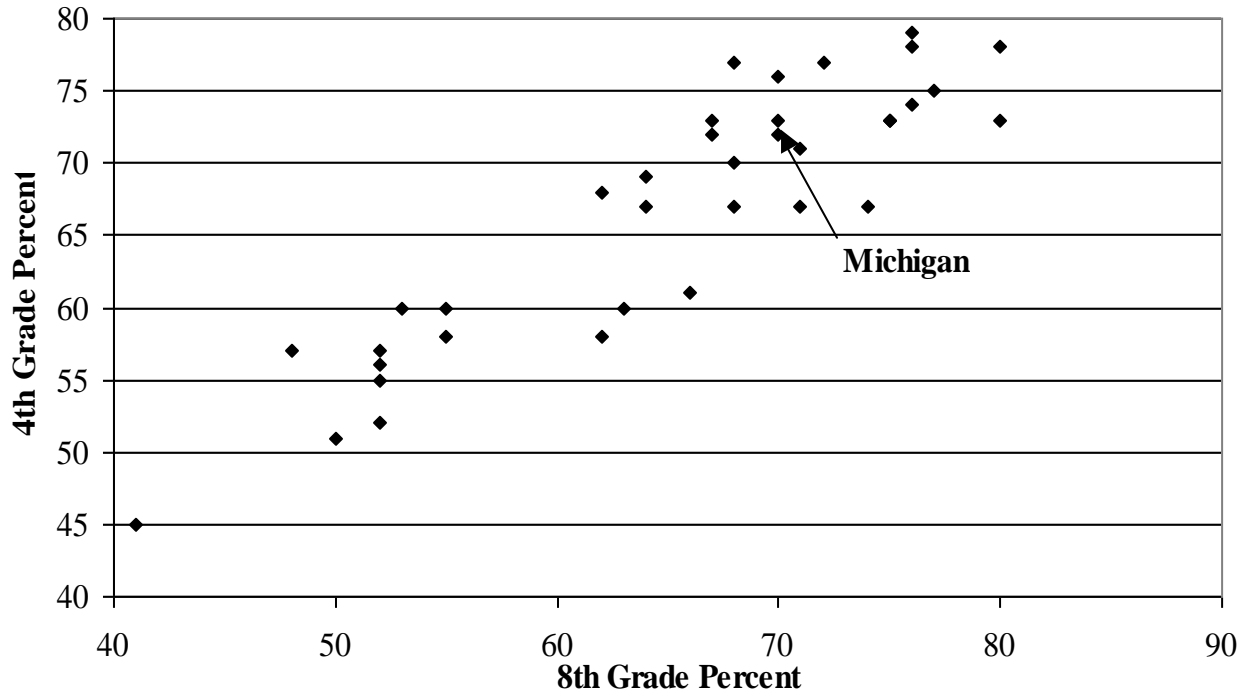


**Figure 2: Current Expenditures Per Pupil, 1960-1998**

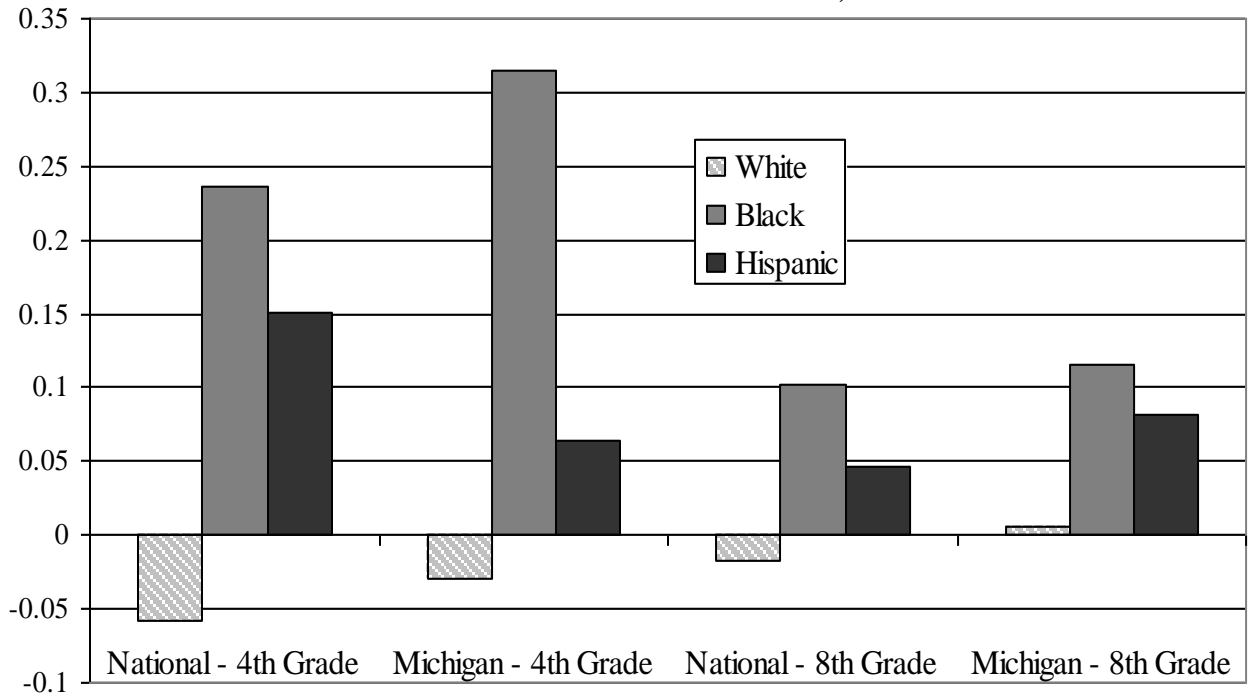
(Source: Digest of Education Statistics Table 168, 2000)



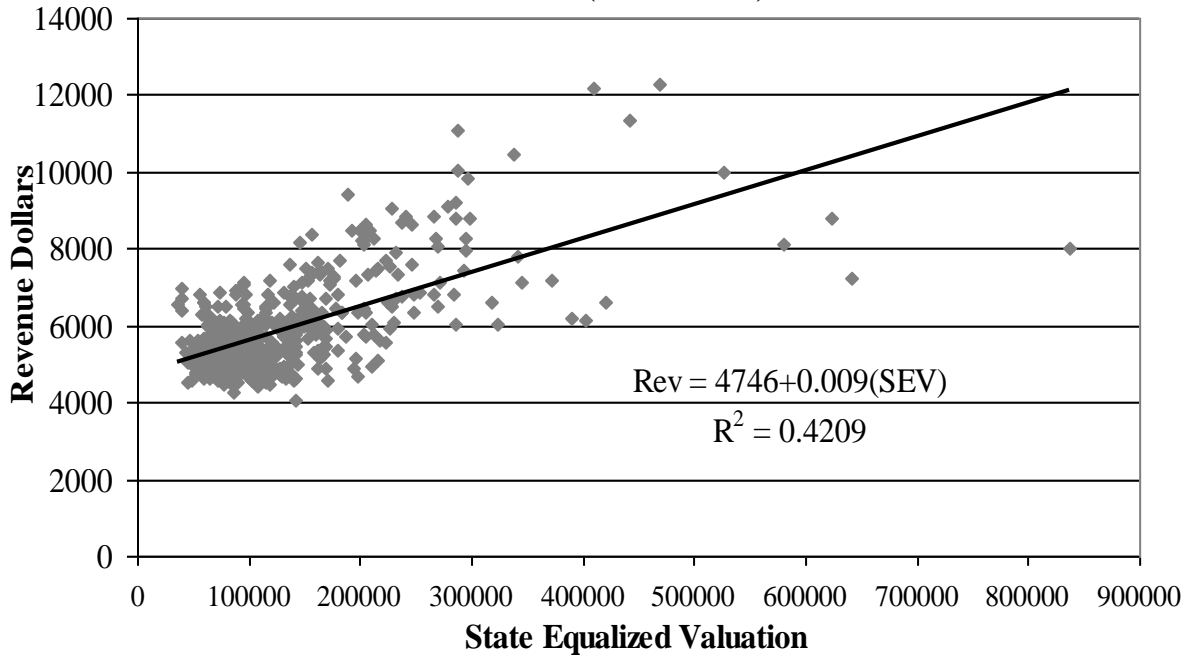
**Figure 3: Percent of Students Scoring at the Basic Level or Above on the NAEP Mathematics Exam, 2000**



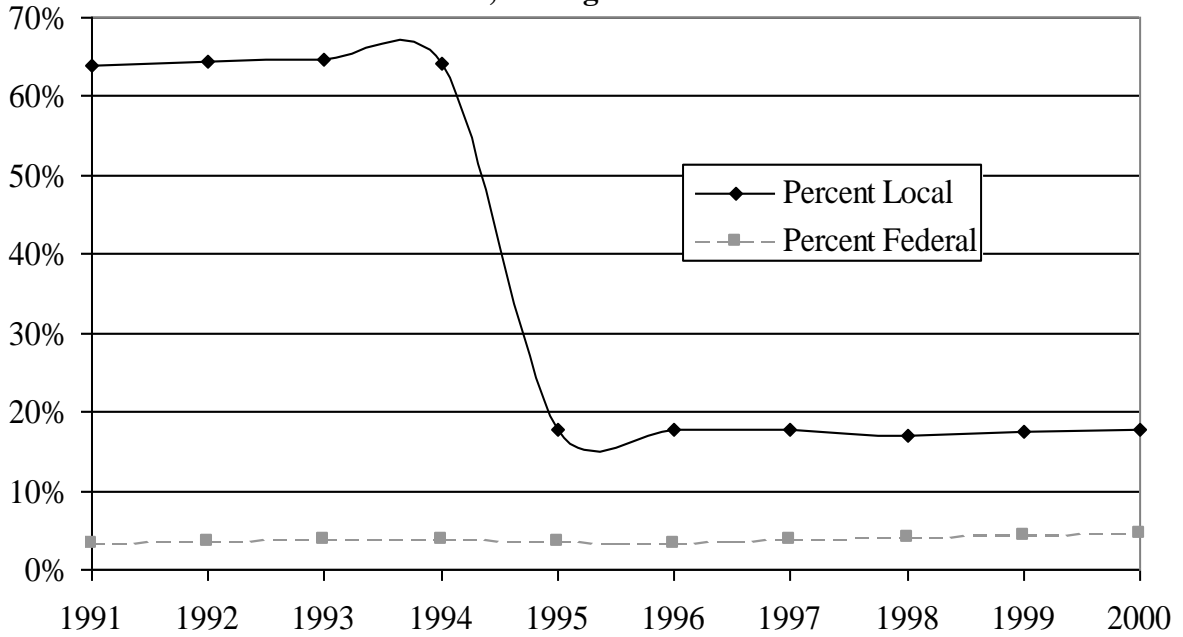
**Figure 4: Gains in Standard Deviations from the National Mean on the NAEP 4th and 8th Grade Mathematics Exam, 1992-2000**



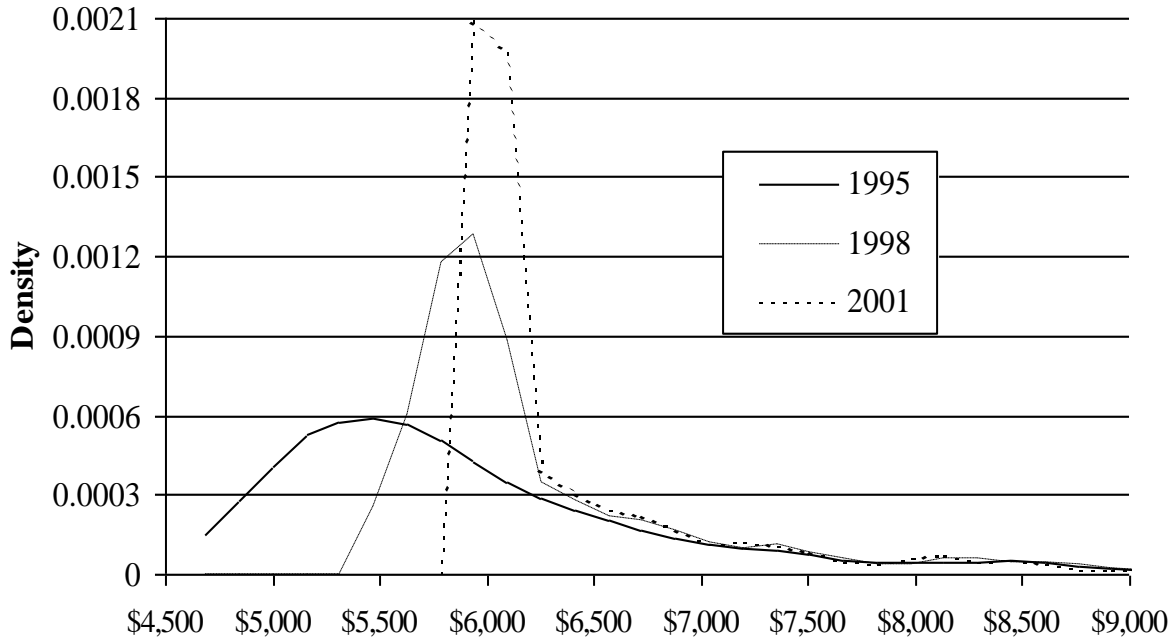
**Figure 5: 1994 Base Revenue Per Pupil Prior to Reform By Per Pupil SEV in 1995 (2001 dollars)**



**Figure 6: Percent of Total School Revenues From Local and Federal Sources, Michigan 1991-2000**

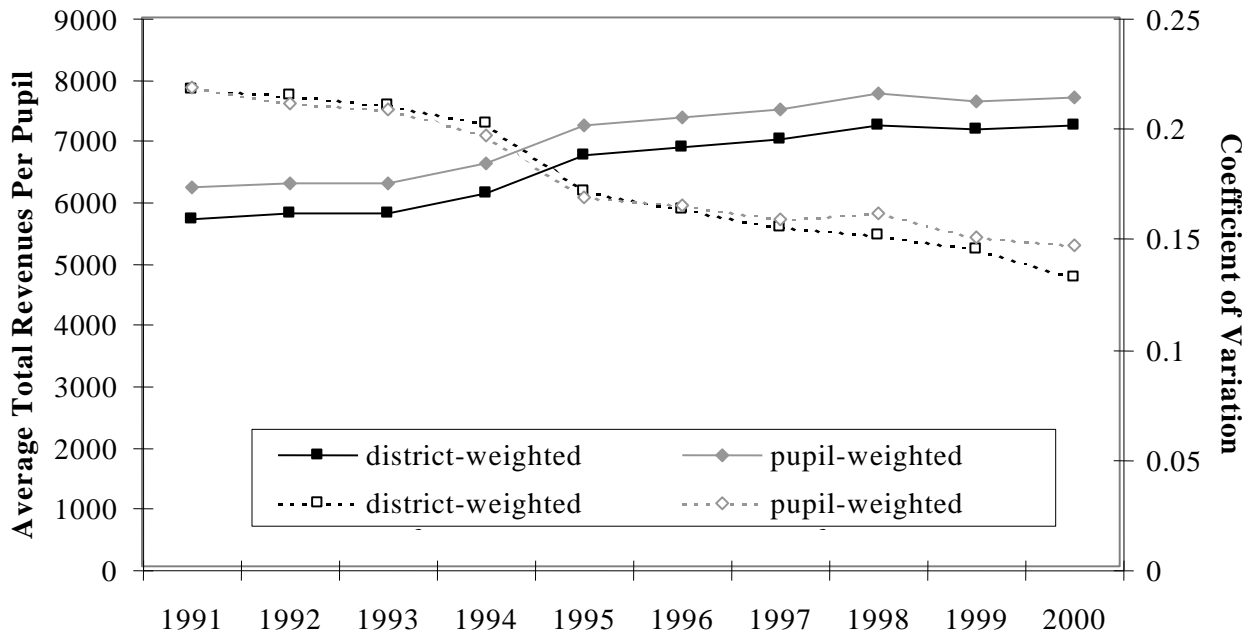


**Figure 7. Probability Density Curves for District Foundation Levels**

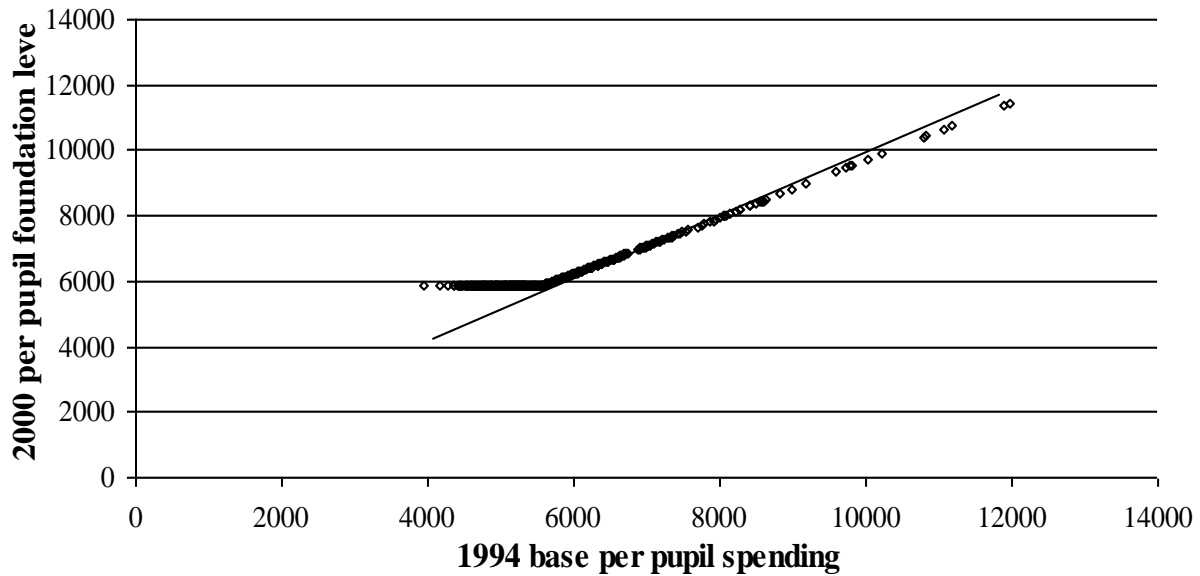


Notes: The curves shown are kernel density estimates of the probability density functions for district foundation levels for the years indicated (in 2001 constant dollars).

**Figure 8: Average Total Revenues Per Pupil and Coefficients of (Standard Deviation/Mean) by Year, 1991-2000 (2001 dollars)**

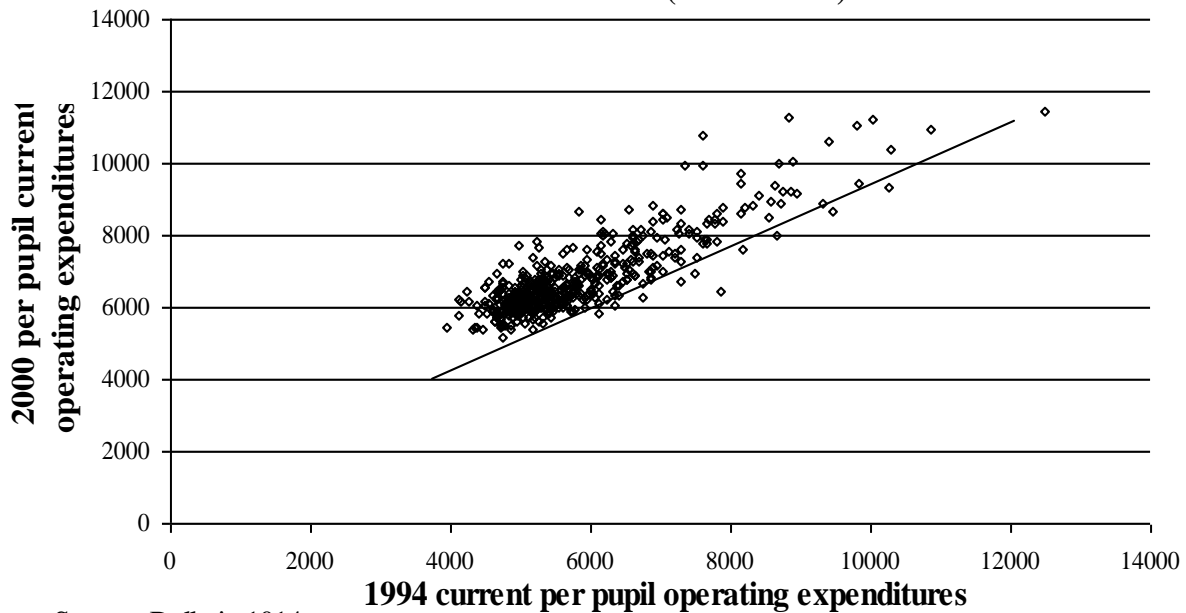


**Figure 9. District Foundation Levels in 2000 as a Function of Base Levels in 1994 (2001 dollars)**



Notes: Though 1994 base per pupil spending is not technically a foundation amount, the system is built from systematic increases starting from this level.

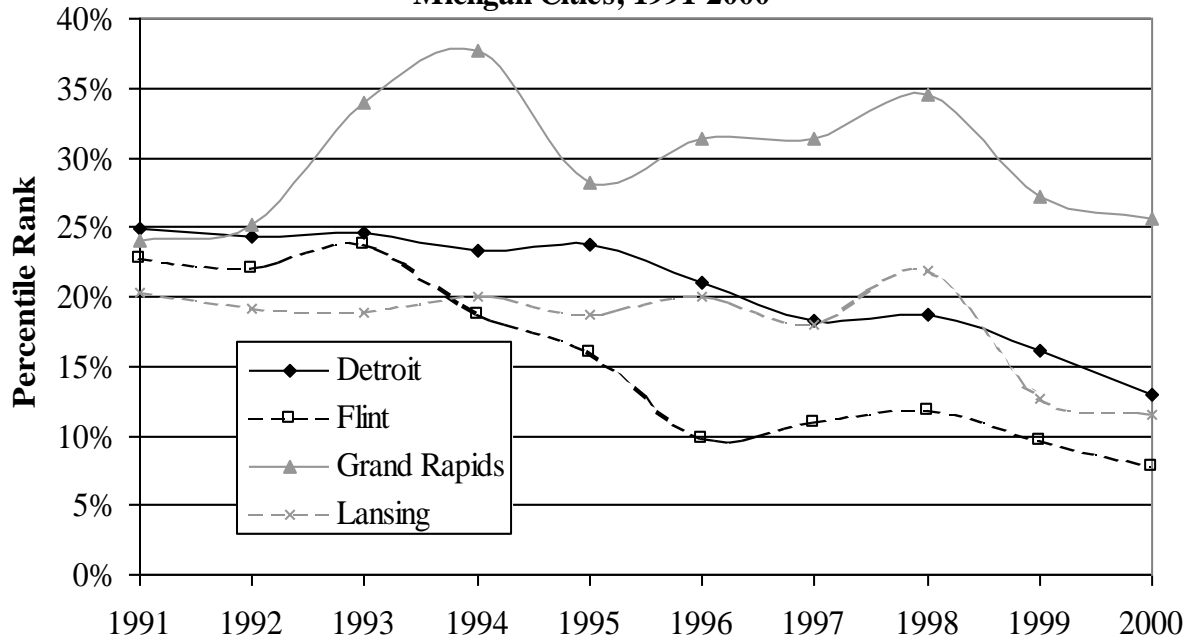
**Figure 10. District Per Pupil Current Operating Expenditures as a Function of 1994 Levels (2001 dollars)**



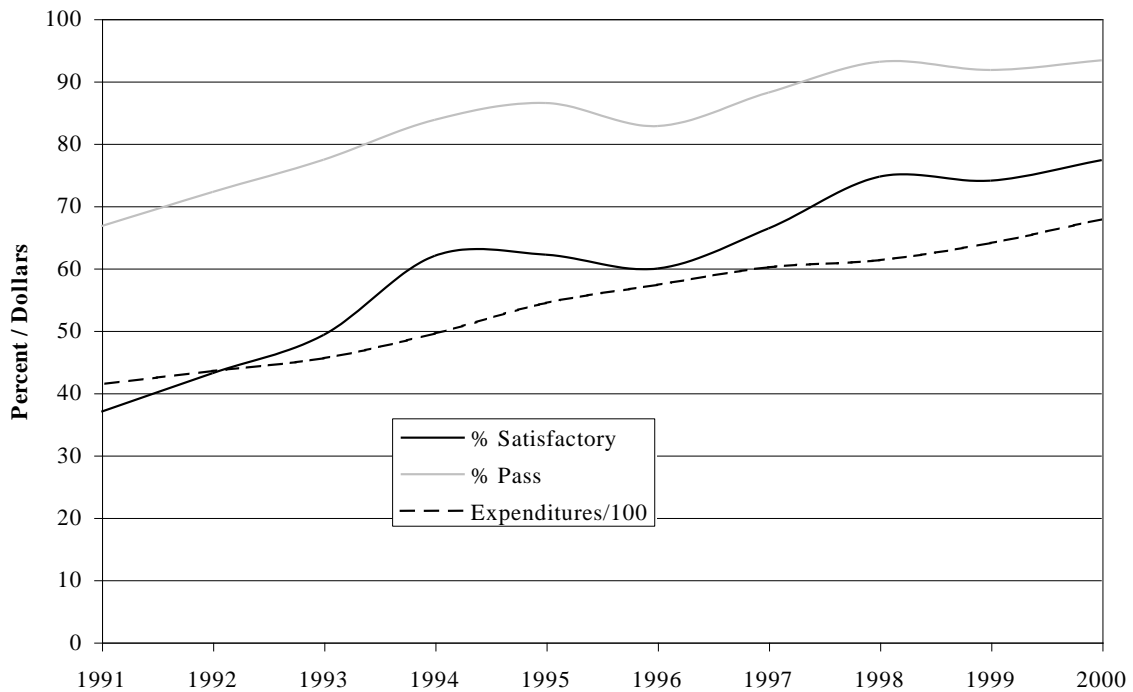
Source: Bulletin 1014.



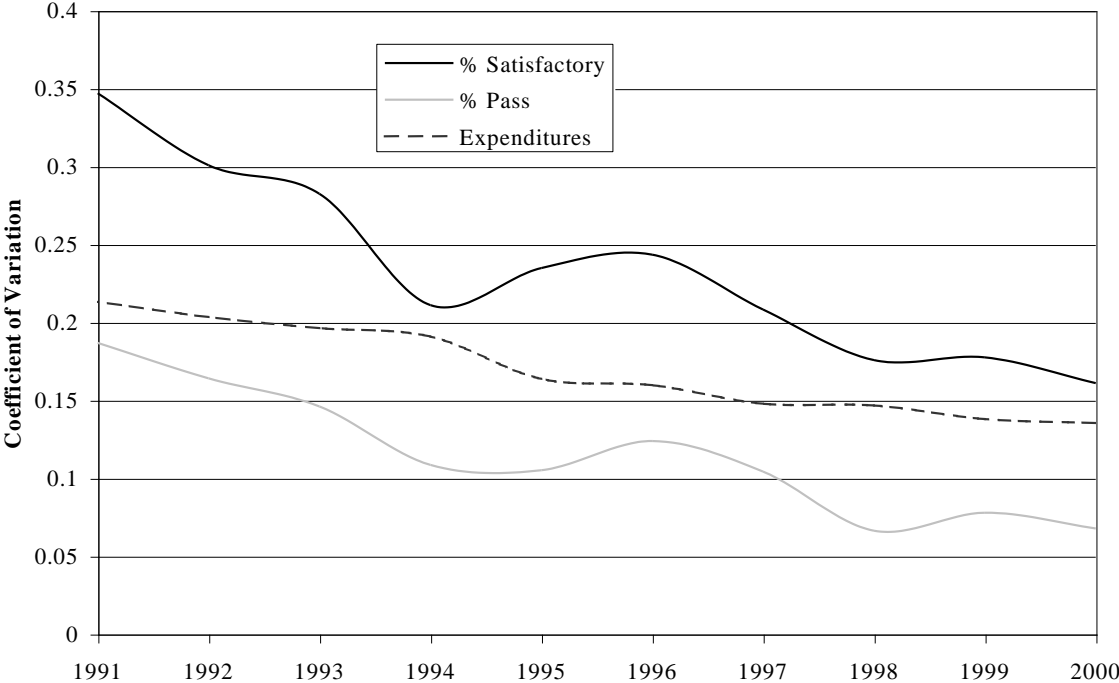
**Figure 11: Percentile Rank in Local and State Revenues Per Pupil for Michigan Cities, 1991-2000**



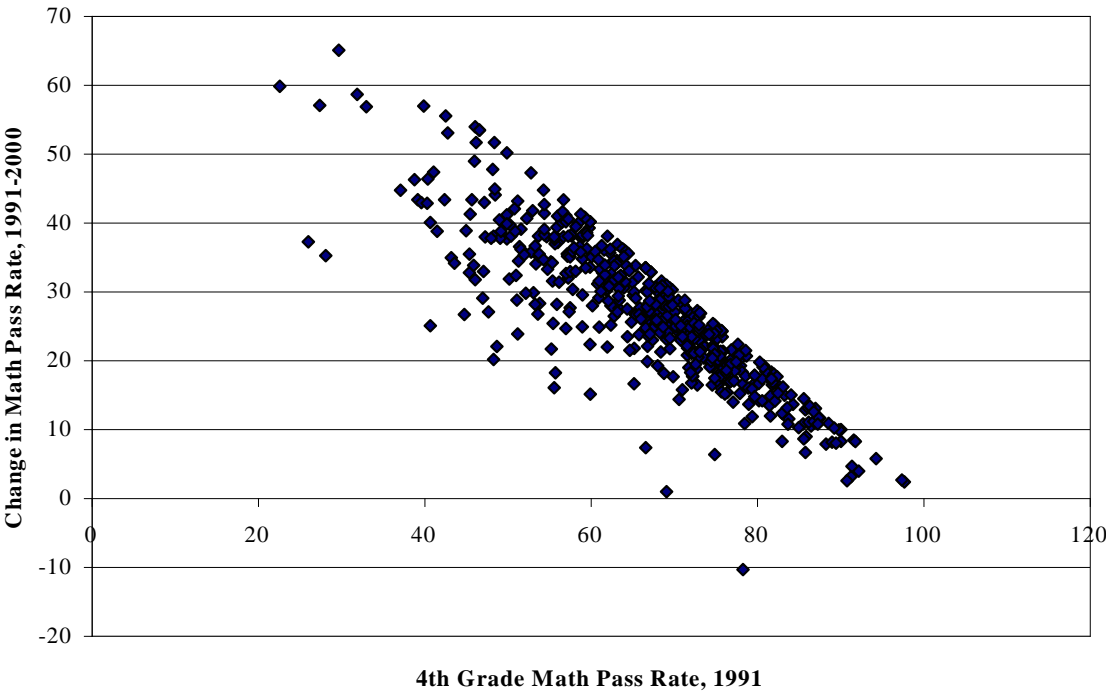
**Figure 12a: 4th Grade Math Pass Rates, Satisfactory Rates and Expenditures, 1991-2000**



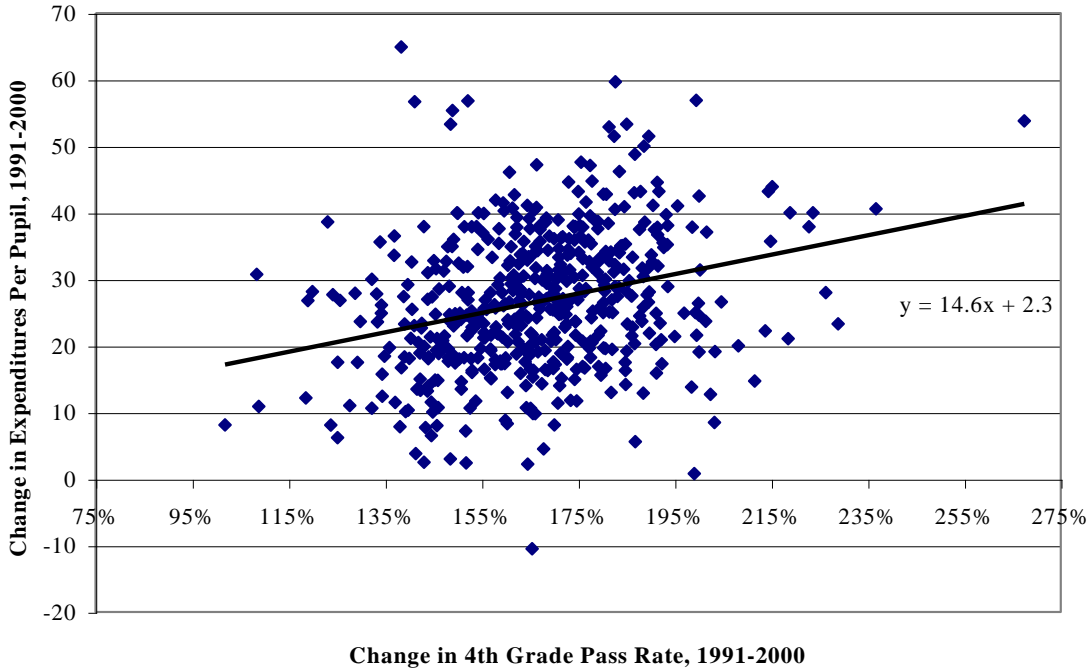
**Figure 12b: 4<sup>th</sup> Grade Math Coefficients of Variation in Pass Rates, Satisfactory Rate and Expenditures, 1991-2000**



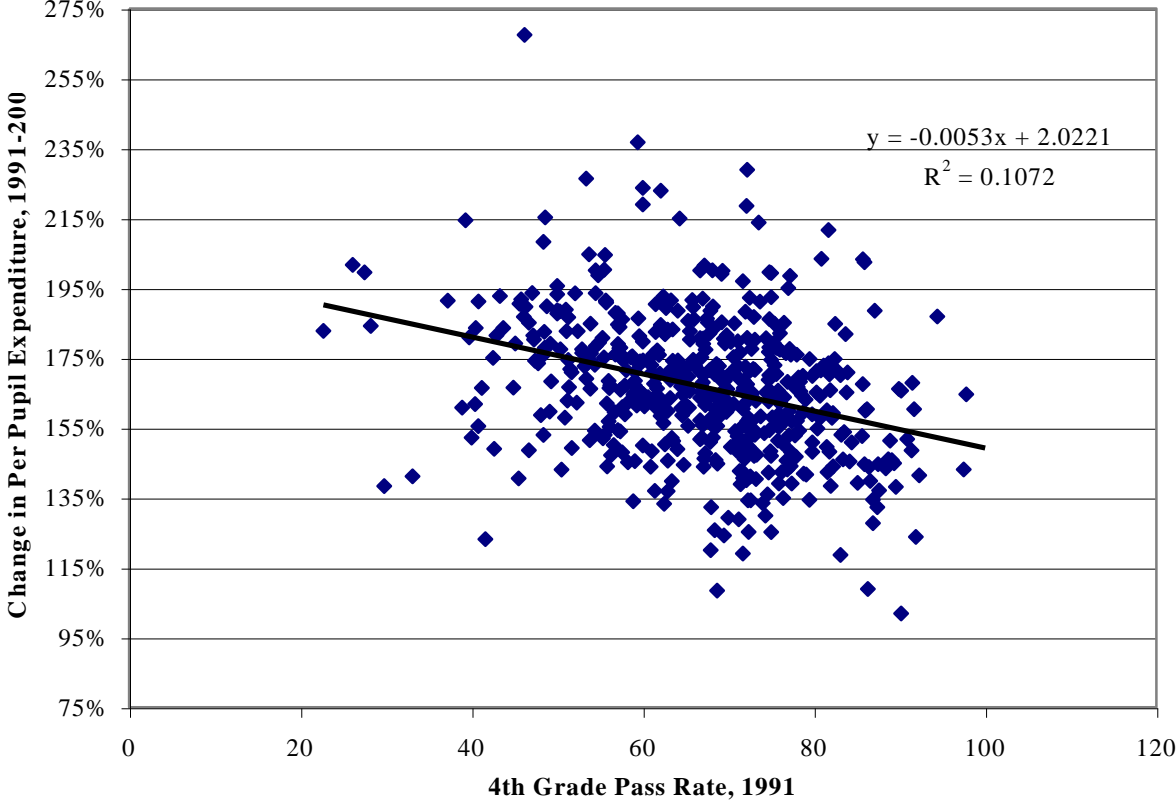
**Figure 12c: Change in the Percent Passing 4<sup>th</sup> Grade Math By 1991 Percent**



**Figure 12d: Changes in Expenditures per Pupil and 4<sup>th</sup> grade Math Pass Rates, 1991-2000**



**Figure 12e: Change in Per Pupil Expenditures by 1991 Math Pass Rates**



**Figure 13: Restricted Portion of Michigan State Government**

