Current Policy Perspectives

FEDERAL RESERVE BANK OF BOSTON™

No. 16-1

Why Have Revenue-Strapped New England School Districts Been Slow to Turn to Alternative Funding Sources?

Thomas Downes

Abstract:
During and even after the Great Recession, numerous popular press stories commented on the apparent growth of non-tax revenues in the face of school district budget deficits. But Downes and Killeen (2014) show that nationally the growth of non-traditional revenues has been far less than these articles may lead the reader to believe. This paper uses data from the New England states to assess the empirical content of some of the possible explanations of this slow growth. In New England, as in the rest of the nation, non-tax revenues per pupil have grown in real terms but have not become a more important source of local revenues. Further analysis of Massachusetts offers equivocal evidence on whether non-tax revenues substitute for or are complements to revenues from overrides of revenue limits. Results from Vermont show that, when the incentives created by a school finance reform are sufficiently strong, districts turn to non-tax revenues in place of property taxes. However, once those incentives are removed, districts shift back to traditional revenues, indicating that districts are not inclined to use alternative revenues as a permanent replacement for property tax revenues.

JEL Classification: I22, H71, H73

Thomas Downes is an associate professor in the department of economics at Tufts University and a visiting scholar in the New England Public Policy Center in the research department of the Federal Reserve Bank of Boston. His e-mail address is thomas.downes@tufts.edu.

Thanks to Bo Zhao, Kathy Bradbury, Bob Triest, Darcy Sass, Kieran Killeen, Robert Clifford, and participants at the NEPPC brown bag and the New England Study Group for their helpful comments.

This paper, which may be revised, is available on the web site of the Federal Reserve Bank of Boston at http://www.bostonfed.org/economic/current-policy-perspectives/index.htm.

This version: July 2016

Introduction

In April 2016, Brockton (MA) Public Schools Superintendent Kathleen Smith submitted a budget proposal that included a recommendation that one school be closed, that $1.5 million be cut from expenditures on administration, and that another $1.5 million be cut from athletics, after-school programs, and technology.[1] The budget problems facing Brockton are not unique; Although the Great Recession nominally ended in 2009, revenues in many districts are still below their pre-recession levels. While property tax revenues were initially slow to decline during the Great Recession, reductions in state aid have forced most local governments to both reduce spending and seek alternative revenue sources. Increases in federal aid insulated school districts from these effects during the first part of the downturn, but school districts began to feel the full impact of the revenue declines in fiscal year 2011 (Kenyon and Reschovsky 2014).

The Brockton example suggests a potential alternative to programmatic cuts is for school districts to gain revenue by charging for ancillary services such as athletics and after-school programs, which schools in most states are not mandated to provide and which benefit primarily or exclusively the consumer of the services. As a result, districts could gain revenue by charging for these services, and changes in consumption that result from such charges typically do not have impacts that extend beyond the family making the consumption decision.

Fees for athletic participation are just one example of the ways in which schools can generate revenues outside of traditional sources; Table 1 gives other examples of these nontraditional sources. And, given the fiscal constraints facing school districts and the potential revenues from charging for auxiliary services, it is unsurprising that numerous popular press stories[2] have commented on the apparent growth of these charges and other non-tax revenues in the face of budget deficits. But while this apparent growth of fees and other nontraditional

[1] See Maria Papadopoulos, "Brockton School Facing Axe in Budget Crisis," *The Enterprise*, April 19, 2016. Available at http://www.enterprisenews.com/article/20160419/NEWS/160415888.

[2] See Jenni Bergal, "Some Schools Are Making Parents Pay for Busing," *Governing Daily*, June 16, 2015. Available at http://www.governing.com/topics/education/some-schools-are-making-parents-pay-for-bussing.html. Katheleen Conti, "Most School Districts Can't Put Brakes on Bus Fees," *The Boston Globe*, August 20, 2015. Available at https://www.bostonglobe.com/metro/regionals/south/2015/08/20/school-bus-fees-persist-despite-better-times/QW8GimGRvV6bYiOYkjlRwM/story.html. Bruce Mohl and Hari Patel, "Rich-Poor Divide in High School Sports," *Commonwealth Magazine*, Fall 2015. Available at http://commonwealthmagazine.org/education/sports-inequality-at-high-school-level/.

revenues[3] has been much noted, it has been far less extensive than these articles may lead the reader to believe, as shown by Downes and Killeen (2014).

This paper assesses the empirical content of some of the possible explanations for the recent slow growth in New England of the practice of supplementing stagnant or declining school district revenue by charging user fees for ancillary services. In particular, we will see whether changing student demographics helps to explain the slow growth. The popular discussion of these revenue sources suggests other possibilities, among them concern about access[4] and philosophical opposition, which we will return to at the end of this paper.[5]

A second, less-ambitious, goal is to provide an overview of the trends in the use of alternative revenues in the New England states and to compare these trends with those of the nation as a whole.

While nationally the use of fees has grown and has shown some sensitivity to revenue constraints created by economic downturns and by tax and expenditure limits, fees and other alternative revenues remain a relatively unimportant source of revenue in New England. Since most school districts in New England are fiscally dependent, comparing the New England case with the national picture can help to clarify whether the fiscal institution of dependency affects the use of alternative revenues.

We show that in spite of their fiscal dependency, with one or two notable exceptions school districts in New England do not appear to have made different use of alternative revenues than their counterparts elsewhere in the nation. Non-tax revenues per pupil have grown in real terms, but their share of local revenues has not increased. As a result, any effects

---

[3] Articles also discuss the growth of tuition revenues (see Jack Sullivan, "Public Schools Extend Their Reach," *Commonwealth Magazine*, Winter 2016, available at http://commonwealthmagazine.org/education/public-schools-extend-their-reach/) and private contributions (see Motoko Rich, "Nation's Wealthy Places Pour Private Money Into Public Schools, Study Finds," *The New York Times*, October 21, 2014, available at http://www.nytimes.com/2014/10/22/us/nations-wealthy-places-pour-private-money-into-public-schools-study-finds.html?_r=0)

[4] Jim Kelly and Betty Funk, "Should Massachusetts High Schools Eliminate Athletic Fees? – The Argument," *The Boston Globe*, March 11, 2016. Available at https://www.bostonglobe.com/metro/regionals/west/2016/03/11/should-massachusetts-high-schools-eliminate-athletic-fees/EBz2vnpFnvptr1SeQO8vzH/story.html. Jenni Bergal, "Some Schools Are Making Parents Pay for Busing," *Governing Daily*, June 16, 2015. Available at http://www.governing.com/topics/education/some-schools-are-making-parents-pay-for-bussing.html.

[5] Katheleen Conti, "Most School Districts Can't Put Brakes on Bus Fees," *The Boston Globe*, August 20, 2015, Available at https://www.bostonglobe.com/metro/regionals/south/2015/08/20/school-bus-fees-persist-despite-better-times/QW8GimGRvV6bYiOYkjlRwM/story.html.

of these revenues on equity in spending have been minimal. And use of these revenues does not appear to have grown during the two recessions in our period of analysis.

To examine more closely the links between a state's school financing system and local use of non-tax revenues, we turned to data from Massachusetts and Vermont. The evidence from Massachusetts is equivocal on whether non-tax revenues substitute for or are complements to revenues from overrides of revenue limits. While the links between alternative revenue use and indicators of override activity are generally weak, revenues from fees may grow immediately after the failure of an attempt to generate override revenues. We note, however, this may not be inconsistent with complementarity. And we see some evidence that communities that benefit most from finance reforms might reduce their reliance on non-tax revenues.

The results from Vermont show that when the incentives created by a school finance reform are sufficiently strong, districts will turn to non-tax revenues in place of property taxes. However, once those incentives are removed, districts will shift back to traditional revenues. These results suggest that districts are not inclined to use alternative revenues as a permanent replacement for property tax revenues.

The Changing Landscape of School Finance and Governance in New England

Since 1990, the landscape of education provision has changed dramatically in each of the New England states. While the changes in accountability have tended to parallel the national changes, those in finance and governance have taken on a uniquely New England flavor. Table 2 gives the timing and the nature of the major changes in each of the six states.[6]

The systems of school financing and the context in which these systems operate vary substantially across the New England states. Surprisingly, the impact on K–12 spending and revenues of the policy changes noted in Table 2 on K–12 spending and revenues is similar across the six states. As an example, we include Figures 1A–1D, which give plots for Rhode Island of per pupil current expenditures; per pupil state aid; local, non-tax revenues per pupil;

[6] Appendix 1 provides details of each state's changes.

and fees per pupil. The data used to generate these figures are drawn from the Common Core of Data of the National Center for Education Statistics; all amounts are adjusted for inflation using the CPI-U. The policy breaks noted in Table 2 are indicated with thin vertical lines, the recessions with thicker vertical lines.

In Rhode Island, as in the other New England states, current expenditures have been consistently trending upward. The finance reforms in Rhode Island appear to have resulted in slight accelerations in the rate of growth; in several of the other states post-reform accelerations in growth have been sharper. The less-notable accelerations in Rhode Island may result from the fact that these reforms redistributed spending without changing the mean. The reform in Massachusetts in 2006–2007 is another example of a reform that primarily redistributed resources without increasing the mean level of spending. The slowdown in growth after recessions, particularly the Great Recession, is evident in all of the states. But even when spending fell in the wake of the Great Recession, the decline was small.

State aid, like current spending, has moved upward in each state, but the movements of aid have been less smooth. Figures 1A and 1B show for Rhode Island the patterns that are common across New England, with more substantial changes in aid than in spending during recessions. Figures for the other New England states are shown in Appendix 1. Declines in aid are evident in almost all of the New England states after the Great Recession. It is these declines that have prompted us to examine the cyclical movement of non-tax revenues.

The plots of aid also make apparent the impact of finance reforms. As in Rhode Island, notable jumps in aid follow finance reforms in each state.

The plots of local, non-tax revenues and of fees are not so simply interpreted. Part of the visual complexity is created by apparent data problems in the 1992–1993 and 1993–1994 school years.[7] The large jump in fees per pupil in 1992-1993 in Figure 1D reflects data issues, not a true increase in the use of student charges. As a result, in the more detailed analyses of Massachusetts and Vermont that follow, we omit these two school years.

[7] While the Census Bureau has collected and makes available the F-33 survey data that is the source of this finance data, the data from these two years have not been made part of the Common Core of Data of the National Center for Education Statistics, unlike the data from other years of F-33 survey. Unfortunately, this means that the data cleaning that usually occurs did not happen for those two years of data.

Also noteworthy is the small size of non-tax revenues and fees relative to current spending. The small scale of fees on the figures means that quantitatively small movements in per pupil fees can appear large visually. But the dominant lesson may be that, throughout New England, non-tax revenues fund a negligible part of education spending. Although the levels of local, non-tax revenues remain small, these figures point to factors that influence the use of these revenues and also to lingering questions about the sources of the fluctuations. Unlike current expenditures and state aid, non-tax revenues and fees exhibit no underlying trends that are common across the states. Local, non-tax revenues in Connecticut and Massachusetts have trended upward, as have fees in Maine and New Hampshire. But these upward movements are the exception, not the rule.

The counter-cyclical movement of fees in Rhode Island after the Great Recession is also an exception. The norm is that both non-tax revenues and fees decline or, at best, remain constant in the aftermath of recessions. The drops in non-tax revenues in Rhode Island after each recession are mirrored by declines in the other New England states. The cyclical movement of these revenues in the New England states corresponds to what we have seen in the rest of the nation (Downes and Killeen 2014).

Some of the jumps in non-tax revenues and fees are roughly contemporaneous with school finance reforms; see the jump in Figure 1C in 1996–1997. How and why finance reforms influence the use of these revenue sources is unclear; we explore the links further in the more-detailed analyses below.

Figures like 1C and 1D cannot indicate the pervasiveness of fees and other non-tax revenues. These figures also cannot be used to determine whether the variation we see is attributable to a few communities or to changes that are common across communities in a state. Tables 3A–3C, which provide basic summary information for selected school years on non-tax revenues in Rhode Island, Massachusetts, and Vermont, shed some light on within-state variability in the prevalence and magnitude of these revenue sources. While most districts collect some non-tax revenues, use of fees is far from universal. There is little variation over time in the prevalence of fees and other non-tax revenues, although there has been a slight uptick in use in recent years. In addition, while the means mirror information in Figures 1C and

1D, the tables reveal both significant variability in use and striking breaks from the overall pattern. For example, in Vermont, prior to the school finance reform (Act 60) that began to be phased-in in the 1998–1999 school year, few districts in the state raised significant revenues using fees and other non-tax revenues. However, by 2002–2003, the mean across districts of local non-tax revenues had increased by almost 90 percent. The large increases in both the variability across districts and the maximum magnitude of these revenues suggest that the increases may have been isolated to a few districts. And, since the 2011–2012 mean of these revenues is nearly the same as the pre-Act 60 mean, the results in this table suggest that the design of Act 60 may have driven the changes. We explore this possibility and other potential sources of within-state and across-time variability in the more detailed analyses of Massachusetts and Vermont discussed below.

Local Non-Tax Revenues in the System of School Finance

The absence in the New England states of any response of fees and other non-tax revenues to cyclical conditions is unsurprising. Downes and Killeen (2014) showed that nationally school districts have not expanded their reliance on these nontraditional revenues, even when faced with temporary reductions in receipts from traditional sources. This lack of responsiveness was also observed in a case study of Colorado (Downes and Killeen, 2016), and in Nelson and Gazley's (2014) analysis of one important component of non-tax revenues: private contributions. This is not to say that the literature finds no links between fiscal constraints and the use of non-tax revenues. Here, we briefly discuss the evidence on factors that seem to influence use of non-tax revenues and note how this evidence affects our analysis of the use of non-tax revenue in Massachusetts and Vermont.

The above-discussed patterns of change in the New England states in fees and all nontraditional revenues echo what has been seen in national analyses: no evidence of counter-cyclical movement in local non-tax revenues. Focusing on specific elements of non-tax revenues does not alter this conclusion, as the figures showing per pupil revenues from fees indicate. And while the literature on private contributions to public schools (Brunner and Sonstelie 1997, Brunner and Sonstelie 2003, Brunner and Imazeki 2005, Downes and Steinman 2008) suggests

that contributions are sensitive to fiscal constraints created by school finance reforms, Nelson and Gazley (2014) find no evidence that contributions are pro-cyclical.

The evidence on the links between private contributions and school finance reforms suggests that the movements we observe above in non-tax revenues in Vermont may be in response to those reforms. However, that literature also makes it clear that not all communities will turn to non-tax revenues in the aftermath of reforms. The extent to which districts increase revenues from private contributions appears to be closely related to the extent to which the finance reforms limit the ease of using property taxes to finance desired expenditures. In the Vermont case, under Act 60 the cost to local taxpayers of using property taxes to finance an additional dollar of spending increased substantially for districts with more property wealth (Downes and Steinman 2008). Act 68 reduced this cost for many districts. Thus, we expect that the relationship between property wealth and private contributions will change under both Act 60 and Act 68. Similarly, since Act 68 removed commercial and industrial property, as well as residential property owned by non-residents, from the local tax base (Saas 2007), the attractiveness of non-tax revenues might have increased in districts with more residential property owned by residents, also known as homestead property.

How to account for the sources of heterogeneity in Massachusetts is less obvious. The extent to which Proposition 2½ binds varies across districts, both because communities may not be at their levy limits and because voters in some communities that had reached their levy limits may have chosen to relax the limit by passing an override. The results of Downes and Killeen (2016) for Colorado, where districts that had passed overrides made more use of local non-tax revenues, suggest that nontraditional revenues and override revenues may be complements, possibly because overrides can only be pursued once all other revenue options have been exploited.

It is even less clear how best to characterize the districts most affected by the changes in the state aid formula that became operative in the 2006–2007 school year. The effects of the core changes in the formula, together with provisions in the law that phased in those effects, were generally not clearly related to the income or property wealth of districts. However, two provisions of the reform did have impacts that were more clearly correlated with district

attributes. Growth aid, which was designed to compensate for increases in district need attributable to enrollment growth or inflation, tended to go disproportionately to less-affluent communities. On the other hand, minimum aid was a windfall for the most-affluent communities. As a result, while the need for local revenues declined in districts receiving additional aid, it is unclear how that change in need is related to income and property wealth. Nevertheless, we try to account for potential changes in the relationship between local capacity and non-tax revenues attributable to changes in the state aid formula.

Digging Deeper: Sources of Variation in Non-Tax Revenues in Massachusetts and Vermont

Massachusetts and Vermont were chosen for further statistical analysis because they have experienced changes in fiscal institutions that have had the potential to influence the use of non-tax revenues. The presence of local tax limits in Massachusetts and significant school finance reforms in both states may have made non-tax revenues an increasingly attractive option. More specifically, since the finance reforms in Vermont have had dramatic effects on the local cost of using property taxes to increase education spending, we can use the Vermont case to see whether significant changes in the attractiveness of traditional revenue sources translate into changes in non-tax revenues. And the Massachusetts context allows us to determine whether, all else being equal, alternative revenues appear to be a substitute for property tax revenues in communities where overrides of Proposition 2½ have failed. Or are alternative revenues a necessary complement to traditional revenues in districts seeking to increase spending through overrides?

We use the timing of policy changes, and their differential impact on school financing of a state's communities, to see whether the extent to which non-tax revenues are generated is affected by the structure of a state's funding system.

Before discussing the results of the detailed statistical analyses of Massachusetts and Vermont, it is worth noting that there is no evidence that movements in the use of non-tax revenues parallel movements in the local tax bases. Across the New England states, each community's ability to generate property taxes depends on its property wealth and income.

State aid, too, depends on property wealth and, in Massachusetts and New Hampshire, on income. As a result, movements in non-tax revenues could potentially be linked to movements in income and property wealth. However, the patterns in equalized value or income do not do a good job of mirroring the movements in local non-tax revenues and fees in either Massachusetts or Vermont.[8] The patterns of equalized value, which is each community's property wealth adjusted to insure that the taxable value of any property is the same anywhere in the state, and income are very similar in the two states. Equalized value is flat or even declining until about 2001–2002, then trends upward until the Great Recession. Value flattens out after the Great Recession. Income moves cyclically, rising in expansionary periods and falling in recessionary periods.

Upward movements in these revenue sources do not coincide with the growth or contraction of non-tax revenues. And fees in Vermont declined until 2001–2002 and then trended upward, mirroring neither the movements in equalized value nor the movements in income. Thus, while variation and movements in equalized value and income may contribute to variation and movements in non-tax revenues, other factors may be at least as important in explaining this variation in non-tax revenues across communities and time. Our discussion above suggests that changes in finance and governance may be among these factors. Now, we explore the links between non-tax revenues and changes in finance and governance in Massachusetts and Vermont, using statistical analysis to account for the influences of property wealth, income, student demographics, and other factors.[9]

Massachusetts: Do Limits Matter?

Our analysis indicates that, in Massachusetts, larger districts make greater use of fees

[8]Appendix 1 includes Figures A1.6A and A1.6B, which plot equalized value per pupil and per capita income in Massachusetts, and Figures A1.7A and A1.7B, which do the same for equalized value and median household income of joint filers in Vermont.

[9] The statistical analysis effectively allows us to examine the impact of school finance reforms, while accounting for demographic characteristics, including the following: enrollment, fraction low income (or free lunch eligible), fraction special education, fraction African-American, fraction Asian-American, fraction Native American, fraction Hispanic, income, equalized value, and the unemployment rate. In Massachusetts, we also control for a number of indicators of the need for and success of overrides of the Proposition 2½ limits. In Vermont, we include measures of the distribution of the tax base that influence the local tax burden. More detail on the statistical analysis, on all of the measures in the analysis, and on the data sources used is provided in Appendix 2. Appendix 2 Tables 1 and 2 give the results of the statistical analyses.

but less use of all non-tax revenues. This result confirms results from Colorado (Downes and Killeen 2016). Few student demographic characteristics appear to be related to the level of non-tax revenues in a district. The percentage of students who are low income in a district is positively related to the use of all alternative revenue sources[10] and negatively related to the use of fees. The former result confirms a finding for Colorado, as does the positive relationship between fees and the share of students with individual education plans (Downes and Killeen 2016). But, in general, there are no consistently strong links between demographic characteristics and non-tax revenues. And, while further exploration of the underlying causes of commonalities across studies might shed some light on why non-tax revenues are little used, the commonalities we see do not imply that non-tax revenues are significantly exacerbating existing inequalities in spending.

In Massachusetts, districts that receive more state aid have lower levels of per pupil fees, suggesting that fees are lower when other revenues are higher. But this result is not duplicated for all non-tax revenues or for federal aid and either revenue source.

The absence of counter-cyclical movements and the ambiguous associations between changes in aid and changes in non-tax revenues suggest that districts do not use these revenues to overcome fiscal constraints. The possibility that non-tax revenues are not used to close fiscal gaps is also consistent with the fact that fees are higher in districts that have passed overrides, a finding that is consistent with evidence from Colorado that non-tax revenues and override revenues may be complements, not substitutes.

However, all non-tax revenues are higher in districts in the first year after an override has failed, suggesting that non-tax revenues are being used to compensate for the inability to access additional property tax revenues. This result appears to be temporary; our results indicate that non-tax revenues do not continue to be higher until an override is passed. Potentially, the first-year effect is both a temporary solution and an attempt to convince voters that all potential revenue options have been explored in preparation for a future override

[10] Since, as Table 1 shows, private contributions are a relatively small source of non-tax revenues, it is unlikely that the positive association between percent low income and non-tax revenues results from increased private grants and philanthropy in urban districts. However, since the bulk of revenues from enterprise activities are included in other miscellaneous revenues, this result may reflect the ability of low-income districts to generate revenues from such sources.

attempt. Thus, the estimate may not be inconsistent with complementarity between non-tax and override revenues.

We also explored how use of non-tax revenues changes when a finance reform changes the distribution of revenues in a state. In Massachusetts, the finance changes that began to be phased-in during the school year 2006–2007 were potentially most beneficial to districts at the bottom and the top of the property wealth distributions. To see whether these districts reduced their reliance on non-tax revenues, we modified our statistical analysis to allow the relationships between the use of non-tax revenue and the use of both property wealth and income to vary across the income and wealth distributions.[11] And we allowed the relationships to change after the finance reform. The association between the use of non-tax revenue and property wealth appears to have been unchanged after the finance reform. But the relationship between income and non-tax revenues does seem to have changed, and this change implies that districts that benefited most from finance reforms shifted away from using non-tax revenues. For example, prior to the finance reforms, the relationship between fees and income was U-shaped, with fee use highest in the lowest- and highest-income communities. That relationship was inverted after the finance reform: fee use now appears to be lowest in the low-income and high-income communities, with fee use peaking in the community with per capita income of $86,667, all else being equal.

These results suggest that the use of non-tax revenue is sensitive to the structure of a state's school finance system, a result also suggested by the national analysis of Downes and Killeen (2014). However, because annual data on per capita income at the community level are available for only a portion of our period of analysis, we need to be cautious about basing strong conclusions on these results.

Vermont: The Importance of Incentives

The lessons from the analysis of data for Vermont are clearer than the estimates for Massachusetts. In Vermont, we can see clearly that local taxpayers turn to fees and other non-

[11] Using all of the available data, we estimated variants of (1) that include the square of equalized value and the interaction of equalized value and its square with an indicator that the data post-date the 2006–2007 finance reform. None of the additional variables were significantly related to fees or all non-tax revenues.

tax revenues when finance reforms increase the cost of raising revenues using the property tax. And when these costs are removed, communities return to the property tax.

As in Massachusetts, in Vermont the associations between student demographics and non-tax revenue levels are weak. Since district-level data on the fraction of students with individual education programs are unavailable from the 2007–2008 school year through the 2010–2011 school year, we performed the statistical analysis with and without that variable. While, as in Massachusetts, fee revenues appear to be higher in districts with larger fractions of students with individualized education programs, the associations between the use of non-tax revenues and other potential determinants of this use are little affected when we account for the fraction of special education students.

In Vermont, even more than in Massachusetts, no association exists between a district's student demographics and its use of non-tax revenues. Further, in Vermont, neither fees nor all non-tax revenues are negatively related to either state or federal aid, seemingly indicating that the revenue sources are not viewed as substitutes.

As we did in Massachusetts, we allowed effects of key variables to change when changes in the finance system changed the relative attractiveness of non-tax revenues for some districts. In Vermont, the Act 60 reforms made it very costly for high-property-wealth districts to raise additional revenues using the property tax. However, as is noted in Appendix 1, individual residents' property tax liabilities were limited by a circuit breaker, which capped tax liabilities as a fraction of income for lower-income residents. Thus, the cost of raising revenues locally using property taxes was potentially mitigated by the circuit breaker provision and by the ability to export property taxes to non-residents. Act 68 substantially lessened the cost of raising revenues with the property tax. But Act 68 also made it more difficult to export the burden of the property tax, since the local tax base was primarily homestead property, meaning resident-owned property.

Prior to Act 60, non-tax revenues were significantly lower in communities with larger tax bases. Fee revenues were also lower in communities with more property wealth, but not significantly so. Under Act 60, that relationship reversed, with fee revenues and all non-tax

revenues larger in high-wealth communities.[12] This reversal is unsurprising, given the high cost of raising property tax revenues in these communities. The use of fees also appears to have been higher in communities with more homestead property, while before the Act took effect it was lower when a larger share of the community's property was owned by residents. Again, this is consistent with districts shifting to fees when the local costs of raising property tax revenues increased.

Figure 2 provides a visual summary of the impact on non-tax revenues of the incentives implicit in Act 60. In that figure, we use the results of our statistical analysis to compare the actual movement of non-tax revenues with the movement that would have occurred had there been no finance reform. The gap between actual non-tax revenues and what revenues would have been absent reforms shows the strength of the impact of changing incentives. On average, non-tax revenues increased between 25 and 50 percent under Act 60. Since, as Table 3C indicates, the changes tended to be isolated in a few property-wealthy districts, the impact of the modified incentives was tremendous in a few communities.

After Act 68, the relationship between non-tax revenues and property wealth reverted to being negative, as one would expect, because Act 68 removed the prohibitively high cost of raising revenues via the property tax. Fee revenues continued to be higher in communities with more homestead property, again a result that is consistent with communities turning to nontraditional revenues when the property tax is more costly to local voters. In sum, the evidence from Vermont indicates that finance reforms alone do not induce notable changes in non-tax revenues. Districts turn to nontraditional revenues when the cost of using traditional sources, such as the property tax, is high. Thus, even the Vermont case indicates that districts are generally loath to turn to nontraditional sources for a significant share of school revenues.

Concluding Remarks

In many dimensions, what we can learn from New England about the use of non-tax revenues in school finance confirms lessons from elsewhere. Fees and other non-tax revenues

[12] Downes and Steinman (2008) provide a detailed discussion of the growth of private contributions in these districts.

represent a relatively small source of revenues, and, while they have grown on a per student basis in most states, they have not grown as rapidly as current spending and have not accentuated inequities. These alternative revenue sources tend to move cyclically, not counter-cyclically, and there is no consistent evidence that they move inversely with state or federal aid.

The New England states do, however, shed considerable light on relationships that earlier work suggested might exist. Both the graphical evidence and the more-detailed analysis of Massachusetts and Vermont indicate that non-tax revenues increase after finance reforms. Districts where the cost of using property taxes rises following reform appear to increase their use of non-tax revenues, and there is some evidence that districts favored by reforms might reduce the use of non-tax revenues. The results add less clarity to our understanding of why non-tax revenues are higher in states with tax and expenditure limits, although we cannot rule out the possibility that non-tax revenues and override revenues are complementary for communities constrained by limits.

The results do not shed any particular light on why non-tax revenues are not used to close gaps during downturns in business cycles although they are used at other times when districts are faced with constraints. Is the answer that districts are only willing to turn to non-tax revenues when the gap that needs to be closed is perceived as permanent? And the minimal growth in non-tax revenues remains a mystery. Possibly, exploring the interactions between school districts and their overlapping governments might indicate whether the use of non-tax revenues in school finance is lower when the use of such revenues to finance other local services is higher. But it may well be that there are limits to what traditional empirical analysis can tell us about what may be seen as underutilization of these revenue sources.

The discussion at the outset of this paper suggested that concerns regarding access and philosophical objections may be among the reasons why non-tax revenues are little used. And the evidence from all of the New England states, particularly Massachusetts and Vermont, is consistent with policymakers steering away from non-tax revenues for these reasons. But philosophical objections are especially difficult to quantify. Surveys of school district leaders may enable us to learn how pervasive these attitudes are and how strongly they correlate with the use of revenues from fees and other non-tax sources. Qualitative analysis of that kind might

be a useful next step in helping us understand why alternative revenues in New England, and in the rest of the country, have been so little used.

References

Bilotti, Celeste P. 2001. "Rhode Island." In Catherine C. Sielke , John Dayton, C. Thomas Holmes, and Anne L. Jefferson, editors, *Public School Finance Programs of the U.S. and Canada: 1998–99.* Washington, DC: National Center for Education Statistics.

Bradbury, Katharine, Karl E. Case, and Christopher J. Mayer. 1998. School Quality and Massachusetts Enrollment Shifts in the Context of Tax Limitations. *New England Economic Review* July/August: 3–20.

Brunner, Eric J., and Jon Sonstelie. 1997. Coping with Serrano: Private Contributions to California's Public Schools. *Proceedings of the 89th Annual Conference on Taxation, National Tax Association, 1997*, pp. 372–381.

Brunner, Eric J., and Jon Sonstelie. 2003. School Finance Reform and Voluntary Fiscal Federalism. *Journal of Public Economics* 87(9-10): 2157–2185.

Brunner, Eric J., and Jennifer Imazeki. 2005. Fiscal Stress and Voluntary Contributions to Public Schools. In William J. Fowler, editor, *Developments in School Finance, 2004*, pp. 39–54. Washington, D.C.: National Center for Education Statistics.

Downes, Thomas A. 2004 "School Finance Reform and School Quality: Lessons from Vermont." In John Yinger, editor, *Helping Children Left Behind.* (Cambridge, MA).

Downes, Thomas A., and Kieran Killeen. 2014. So Slow to Change: The Limited Growth of Nontax Revenues in Public Education Finance, 1991–2010. *Education Finance and Policy* 9: 567–599.

Downes, Thomas A., and Kieran Killeen. 2016. Why Has Growth of User Fees and Other Nontraditional Sources of Local Education Revenues Been So Limited? Unpublished manuscript. April.

Downes, Thomas A., and Jason Steinman. 2008. Bake Sales and School Budgets: Alternative Revenue Generation in Vermont after Act 60. Unpublished manuscript.

Downes, Thomas A., and Jeffrey Zabel. 2009. Incomplete Grade: Massachusetts Education Reform at 15. MassINC Policy Center Report. Available at http://massinc.org/research/incomplete-grade/.

Gottlob, Brian J. 2003. The Results of the New Hampshire Education Funding Reform. The Josiah Bartlett Center for Public Policy. June.

Kenyon, Daphne A., and Andrew Reschovsky. 2014. "Introduction to Special Issue on the Property Tax and the Financing of K–12 Education." *Education Finance and Policy* 9: 373–382.

Maine Department of Education. 2010. School Administrative Reorganization. Available at http://www.maine.gov/education/reorg/index.html.

Nelson, A.shlyn A., and Beth Gazley. 2014. The Rise of School-Supporting Nonprofits. *Education Finance and Policy* 9: 516–566.

Saas, Darcy R. 2007. School Finance in Vermont: Balancing Equal Education and Fair Tax Burdens. NEPPC Discussion Paper 07-1, Federal Reserve Bank of Boston.

Schmidt, Stephen J., and Karen Scott. 2006. Reforming reforms: Incentive Effects in Education Finance in Vermont. *Education Finance and Policy* 1: 441–464.

Tappin, Ryan J., and Steve Norton. 2009. New Hampshire's Latest School Funding Formula. New Hampshire Center for Public Policy Studies. March.

Verstegen, Deborah A. 2015. A Quick Glance at School Finance: A 50 State Survey of School Finance Policies. Available at https://schoolfinancesdav.wordpress.com/.

Wassmer, Robert, and Ronald Fisher. 2002. Interstate Variation in the Use of Fees to Fund K–12 Public Education. *Economics of Education Review* 21(1): 87–100.

Table 1
Types of Local Non-Tax Revenues

Type of Revenue	Mean Across Massachusetts Districts in 2013–2014	Examples
Fees and Charges	$25.33	1) Transportation fees ($0.06) 2) Charges for participation in athletics and other extracurricular activities
Rents and Royalties	$1.59	Rental of a vacant school building to a charter school
School Lunch Revenues	$72.53	Revenues from lunch purchases by students not eligible for free lunches
Tuition Fees	$103.94	Tuition payments by foreign students living with an in-district family
Private Contributions	$16.87	1) Contributions made through PTA or PTO 2) Booster club contributions 3) Contributions made by an educational foundation
Interest Earnings	$1.20	
Other Miscellaneous Revenues (including property sales, fines)	$159.13	1) Property sales (0) 2) Fines (0)
All Non-Tax Revenues	$362.04	

Table 2
Timing of Changes in the Landscape of School Finance and Governance in New England Since 1990

State	Type of Policy Change		
	Reform of System of School Finance	**Tax or Expenditure Limit**	**Other Major Change in Governance**
Connecticut	1995–1996; 2007–2008	1993 (state expenditures)	None
Maine	2005–2006	2005 (state expenditures); 2006 (local revenues)	Mandatory consolidations beginning before 2009-10
Massachusetts	1993–1994; 2006–2007	No changes	None
New Hampshire	1999–2000, 2010–2011	No changes	None
Rhode Island	1997–1998; 2011–2012	1992 (state expenditures)	None
Vermont	1998–1999 (Act 60); 2005–2006 (Act 68)	None	None

Figure 1A

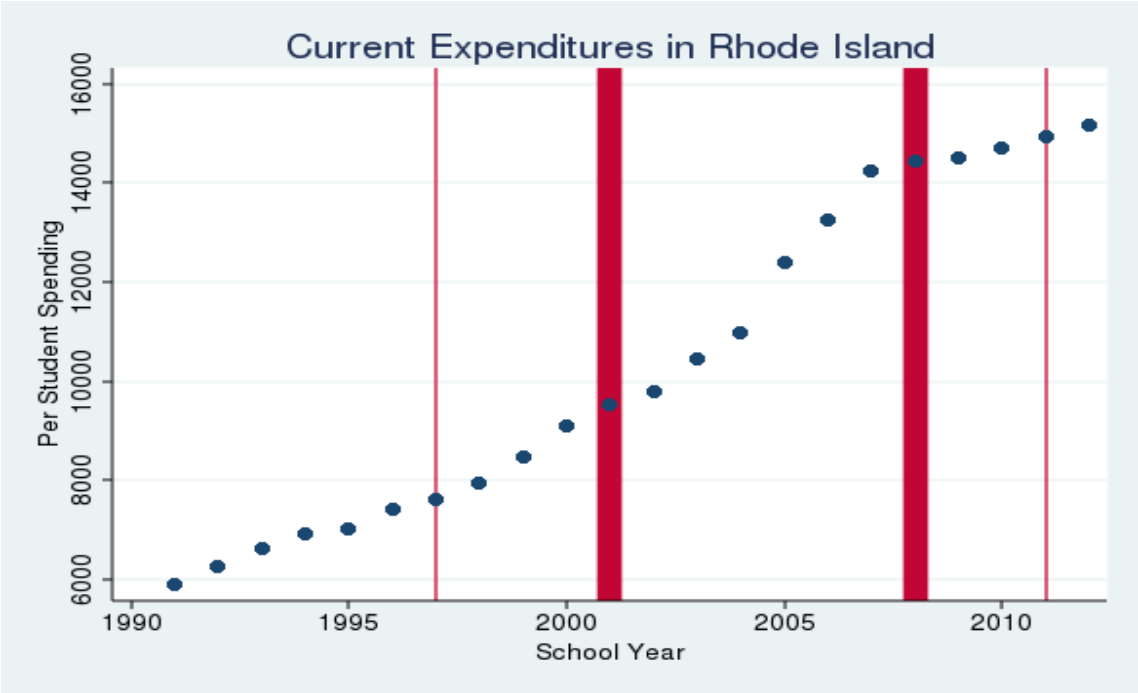


Figure 1B

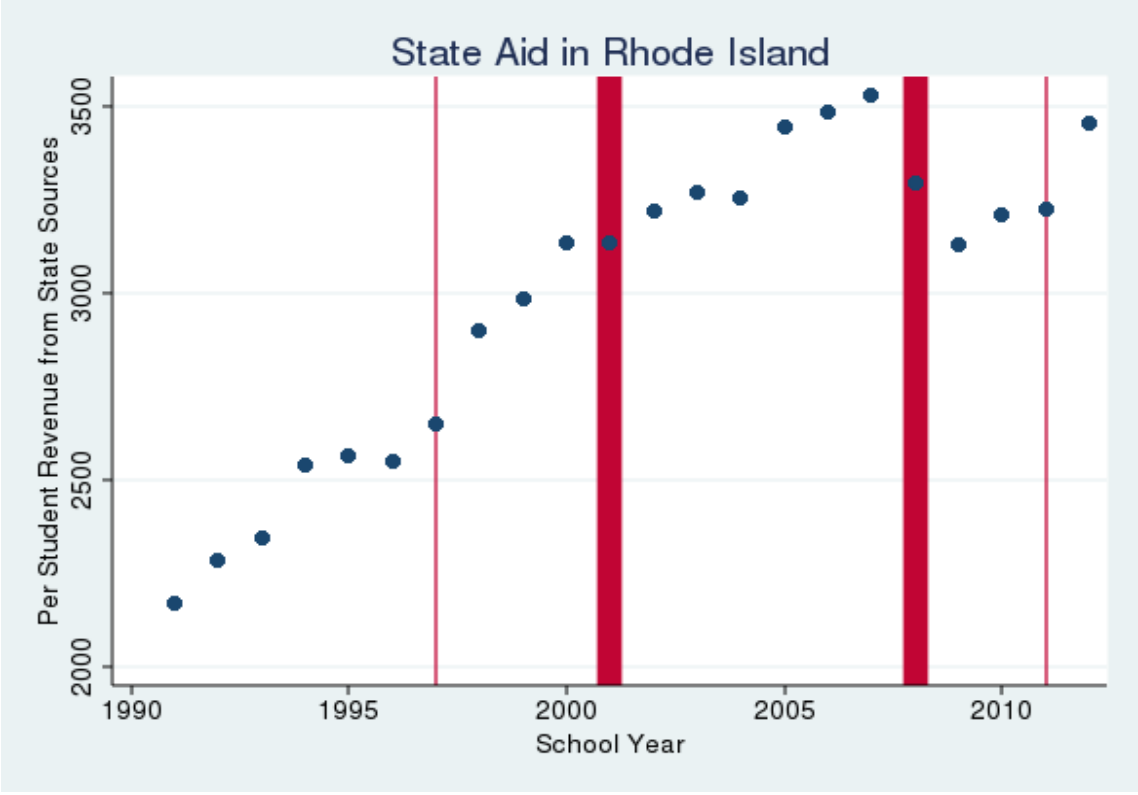


Figure 1C

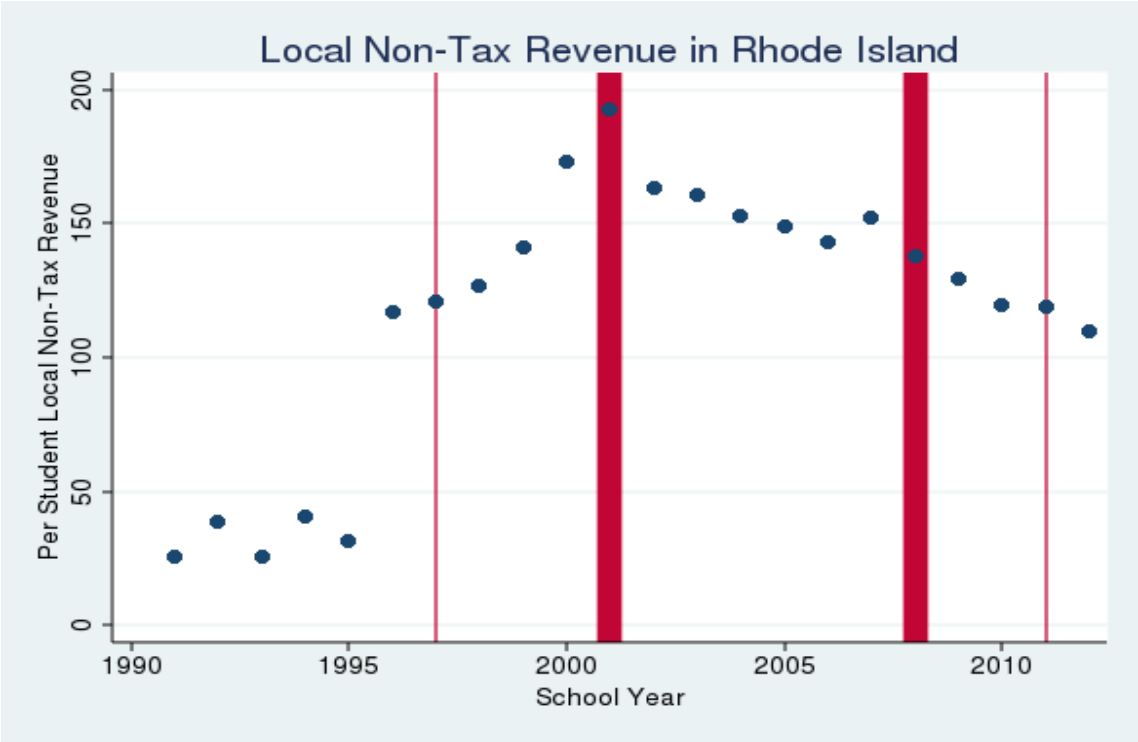


Figure 1D

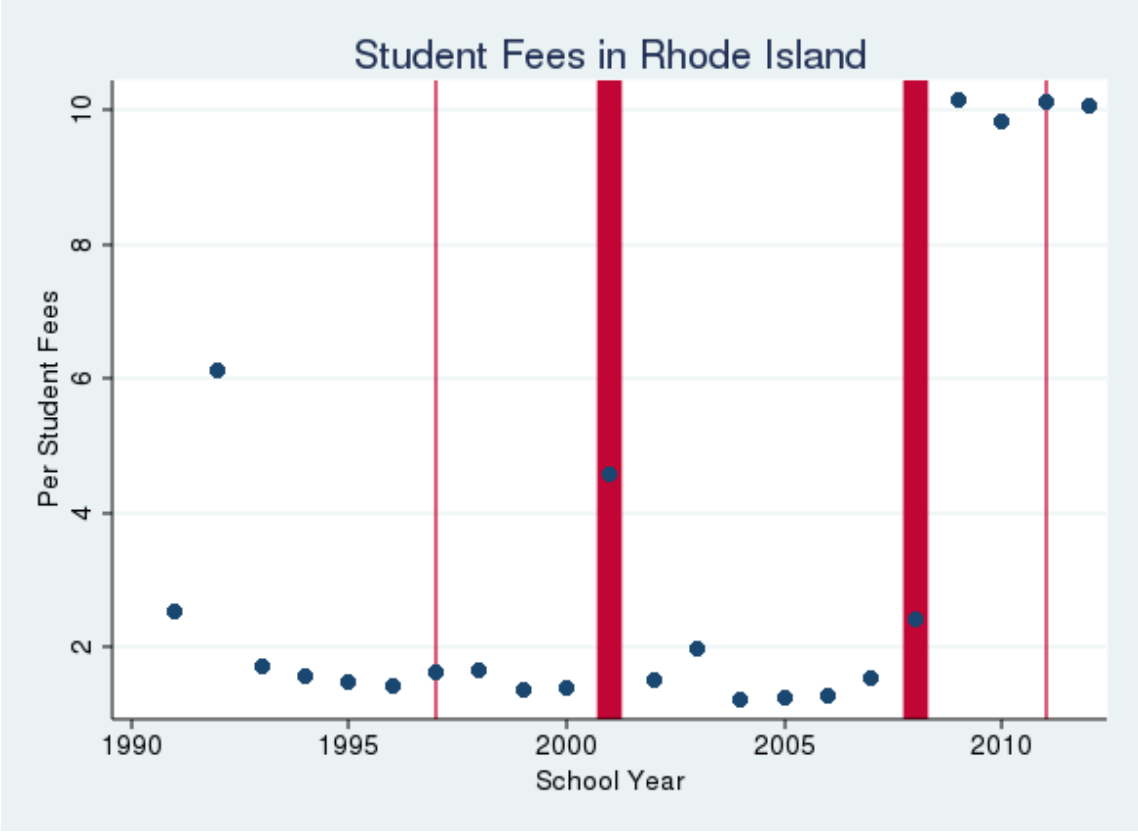


Table 3A
Fees and Local Non-Tax Revenues in Rhode Island
Summary Measures

School Year	1991–1992	1996–1997	2000–2001	2004–2005	2008–2009	2012–2013
Fees Per Pupil						
Mean	2.8664	1.2162	1.3508	1.3947	2.2478	11.1422
Standard Deviation	7.0449	2.1209	2.3584	3.1193	3.6080	22.7854
Minimum	0.0000	0	0	0	0	0
Maximum	40.2918	8.1532	8.0678	15.5227	14.5167	104.0855
Percent of Districts with Revenues>0	43.24	41.67	44.44	41.67	47.22	75.00
Local Non-Tax Revenues Per Pupil						
Mean	31.4479	131.6492	257.8612	173.7242	166.6430	140.2789
Standard Deviation	29.5874	40.8459	280.6434	65.1101	61.5556	94.4909
Minimum	0.0000	49.9589	36.6140	73.3519	57.0520	30.2668
Maximum	112.4315	200.5440	1708.7563	342.8540	339.1627	595.0203
Percent of Districts with Revenues>0	97.30	100.00	100.00	100.00	100.00	100.00

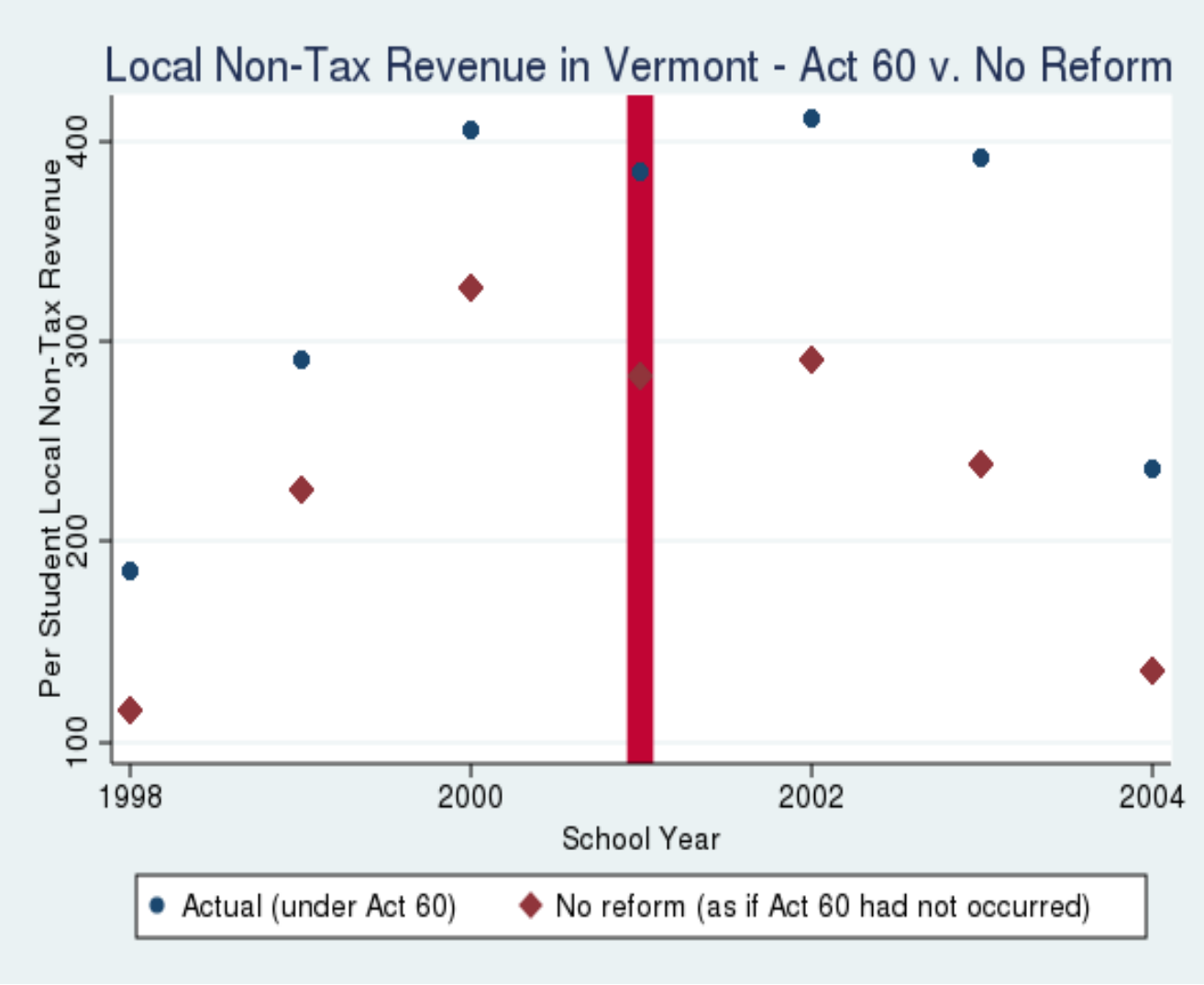
Table 3B
Fees and Local Non-Tax Revenues in Massachusetts
Summary Measures

School Year	1994–1995	1998–1999	2002–2003	2006–2007	2011–2012
Fees Per Pupil					
Mean	12.2389	12.6273	13.7063	20.8960	24.5432
Standard Deviation	17.3310	26.3326	18.9378	25.7287	30.5097
Minimum	0	0	0	0	0
Maximum	132.6871	367.9804	151.1299	237.4267	251.7375
Percent of Districts with Revenues>0	74.32	74.58	73.58	75.95	76.53
Local Non-Tax Revenues Per Pupil					
Mean	213.4884	208.3808	291.7891	359.5997	357.8775
Standard Deviation	176.1454	174.1107	308.9997	339.9182	422.2619
Minimum	0	0	0	0	0
Maximum	1574.7665	1904.0476	4505.7769	5109.6699	6746.2920
Percent of Districts with Revenues>0	98.31	96.95	97.66	99.33	98.30

Table 3C
Fees and Local Non-Tax Revenues in Vermont
Summary Measures

School Year	1995–1996	1998–1999	2002–2003	2006–2007	2011–2012
Fees Per Pupil					
Mean	5.9613	4.4997	3.9730	2.1989	6.5143
Standard Deviation	23.0447	28.2502	22.8843	9.9306	20.2788
Minimum	0	0	0	0	0
Maximum	234.0836	355.7679	272.1379	109.6881	160.8994
Percent of Districts with Revenues>0	21.93	12.63	14.77	11.39	20.98
Local Non-Tax Revenues Per Pupil					
Mean	269.3024	233.3808	439.9098	364.8104	296.4795
Standard Deviation	210.5371	151.4015	892.2078	218.0710	335.1705
Minimum	0	30.17361	0	12.1248	0
Maximum	2287.1245	920.4327	6437.3301	1472.2729	3642.5071
Percent of Districts with Revenues>0	99.56	100.00	99.58	100.00	99.11

Figure 2


Local Non-Tax Revenue in Vermont - Act 60 v. No Reform
Per Student Local Non-Tax Revenue
100
200
300
400
1998
2000
2002
2004
School Year
Actual (under Act 60)
No reform (as if Act 60 had not occurred)

Appendix 1: A Recent History of School Finance and Governance in the New England States

Connecticut

The Education Cost Sharing (ECS) program, which governs the majority of state aid in Connecticut, was implemented in 1989–1990. As is the case with most state aid formulas, the ECS formula has been tweaked on an almost annual basis. However, during the period for which we have data (1991-92 to 2012-13), two major changes to the formula had the potential to alter the way towns raised revenue to fund their schools (Verstegen 2015). First, in the 1995–1996 school year, the state folded funding for special education into the ECS formula.[13] Then, in the 2007–2008 school year, the formula was revised in line with recommendations made by the governor's Commission on Education Finance. While the changes increased target aid levels in nearly all communities, the increases were relatively larger in low-wealth and high-cost communities.

Although communities can effectively limit the taxable values of properties by choosing to adjust the taxable value more slowly than the change in the actual value, this phasing-in of changes in valuation is unlikely to constrain the ability of communities to raise revenue, since districts are unconstrained in their choice of tax rates. Legislation in 2011 that extended phasing-in to devaluations further weakened any potential impact of this limit, since communities now have even more ability to smooth changes in property tax revenues. As a result, such limits usually have little effect; only the limit placed on state government expenditures in 1993, noted in Table 2 of the main text, would be expected to have any impact on local revenue-raising patterns.

[13] The state Supreme Court's decision in the *Sheff v. O'Neill* case, which required the state to take steps to address segregation in Hartford, was also handed down in 1996.

Maine

In the 2005–2006 school year, a major modification of Maine's school funding formula became operative (Verstegen 2015). The revised formula based aid on adequacy-based calculations and had the effect of steering more aid to higher-cost districts. These changes in the formula were contemporaneous with the imposition of municipal property tax limits, which had the potential to limit property tax revenues in fiscally dependent districts. A state expenditure limit also went into effect at that time.

Of potentially equal importance in its implications for revenue-raising patterns was the state's school administrative reorganization law, which effectively mandated consolidation of the smaller school districts in the state. At the time the legislation was passed in 2007, there were 290 school districts in Maine. That number had fallen to 164 by the 2011–2012 school year, with most consolidations occurring before the 2009–2010 and 2010–2011 school years (Maine Department of Education, 2010). While it is not easy to predict the potential effects of these consolidations on the use of non-tax revenues, it seems plausible to assume that consolidation will change the dynamics of budgeting. Further, regional districts in Maine are fiscally independent, while districts that are coterminous with cities and towns are not.

Massachusetts

The two policies in Massachusetts that most directly influence local revenue choices essentially pre-date our period of analysis. The first of these, Proposition 2½, was passed by the state's voters in 1982. The proposition limited both the level and the growth of property tax revenues. Of the two limits, the levy limit has proven to be the one that binds (Bradbury, Case, and Mayer 1998). In communities faced with a binding levy limit, voters can approve an override, allowing property tax revenues to increase.

Absent such an override, non-tax revenues may be the only option for constrained communities to avoid spending cuts.

The school funding formula in place today in the Commonwealth was established by the Massachusetts Education Reform Act (MERA) of 1993. Downes and Zabel (2009) provide details on MERA and the evolution of the funding formula. The most significant modification to the funding formula took effect in the 2006–2007 school year. The changes included updating each community's measure of fiscal capacity continually using more-current measures of income and property wealth, requiring each community to raise locally their mandated revenue, adjusting aid to compensate fully for growth in a district's need, and assuring each community that state monies will cover at least 17.5 percent of its formula-determined need, even if the formula indicates that less aid is needed. While the effects of many of these changes are not clearly related to a community's income and property wealth, the last change reduced the amount of locally raised revenue needed in communities with the highest fiscal capacity.

New Hampshire

New Hampshire's financing system has been modified several times in the last decade in response to a series of state Supreme Court decisions in the *Claremont v. Governor* case. While the first decision in the *Claremont* case was handed down in 1993, it was the 1997 decision that led to finance reforms that became operative in the 1999–2000 school year. The core element of the reform was a statewide property tax from which revenues were retained in each district and counted against the revenues required to cover each district's need (its foundation level). In most districts other state revenues were used to close the gap between retained revenue and the foundation amount. In a small set of donor districts, revenues from the state property tax exceeded the foundation amount. The excess revenues went to the state (were recaptured) and became a portion of the revenues used to finance aid (Gottlob 2003). In these districts, property tax rates increased, potentially making non-tax revenues more attractive.

In 2006 the New Hampshire Supreme Court again issued a ruling in the *Claremont* case. This ruling stated that the basis for each district's foundation amount, the definition of an adequate education, lacked precision. In response, the legislature created a precise definition of an adequate education and used that definition as the basis for each district's foundation amount. The new finance system also redefined capacity, shifting from a capacity measure based solely on property wealth to one that is a weighted average of income and property wealth. The new system, which began to be phased-in in the 2010–2011 school year, generated larger absolute increases in aid in towns with the lowest income and lowest property wealth. However, on a percentage basis, towns with the highest property wealth experienced the largest increases in aid (Tappin and Norton 2009).

Rhode Island

While Rhode Island's school funding system was modified in the mid-1990s, it effectively operated in much the same way throughout our period of analysis. Through the 1994–1995 school year, there were seven aid programs, all of which operated on a retrospective basis. The state reimbursed a share of each district's expenditures, with the share reimbursed for operations based on each district's property wealth per pupil relative to statewide property wealth per pupil. Beginning in the 1994–1995 school year, an equity fund was added, with each district's share of funds based on the number of students in the district eligible for free- or reduced-price lunches (Bilotti 2001).

Beginning in the 1997–1998 school year, the state switched from retrospective to prospective funding, with aid distribution based on each district's relative student need. Aid continued to be divided between general aid and eight different categorical funds (Bilotti 2001).

In 2011–2012 the state moved to a more traditional formula, folding all of the categorical funds into the base. A 'student success factor,' which depended on a district's poverty density, determined the extent to which a district's foundation amount exceeded the amount needed to fund a basic instructional program (Verstegen 2015).

All school districts in Rhode Island are subject to a levy limit that dates back to 1986. Also, since 1992 there has been a limit on state government expenditures.

Vermont

In response to a 1997 decision of the Supreme Court of the State of Vermont in the *Brigham v. State* case, which invalidated the existing system of education finance, the legislature rapidly passed Act 60. As Saas's (2007) excellent review of the changes in Vermont school finance makes clear, the legislation had dual goals: to create an equitable system of finance and to provide property tax relief. Act 60 created a system of school financing that combined elements of foundation and power equalization plans. As in New Hampshire, a core element of the foundation aid system was a statewide property tax. And, as in New Hampshire, if the property tax revenues generated by levying the statewide rate exceed the amount needed to finance the foundation level of spending, the excess property tax revenues are recaptured by the state.

In both New Hampshire and Vermont, localities can and do spend more than the foundation amount. In New Hampshire, the state makes no attempt to equalize the ability to generate revenues above foundation. The choice in Vermont has been to attempt to equalize this ability with a power equalization scheme that insures that localities with the same nominal tax rates have the same levels of spending. The way this was done under Act 60 was the most controversial part of the legislation. In most district power equalization systems, aid drawn from state funds supplements the tax yields of the low-property-wealth towns. Act 60 deviated from this norm, creating a sharing pool that directly tapped local property tax revenues from property-rich ('gold') towns to supply the aid to property-poor towns. Because the sharing pool's redistribution mechanism used property tax revenues from gold towns to finance the power-equalizing aid to property-poor towns, the property taxes required to increase per pupil spending by one dollar increased significantly in property-rich towns, while the taxes required for an additional dollar of education spending fell in property-poor towns. Schmidt and Scott (2006) document the dramatic impact of the reforms on the dollar

amount of property taxes per pupil required to fund an additional dollar of spending (also known as the tax price) for education faced by Vermont towns.

The new financing system created by Act 60 produced property tax relief in property-poor communities because it allowed localities to maintain or even increase education spending with substantially lower tax rates. But, with a statewide property tax, taxpayers in gold towns faced increases in their property tax payments.[14] To provide property tax relief to low-income residents of the gold towns, the drafters of Act 60 limited property tax payments as a share of income for all taxpayers with income below an income threshold. This circuit breaker nullified the negative effects of the sharing pool for these taxpayers.

Act 60 did not regulate the generation of non-tax revenue; every dollar of non-tax revenue generated directly increased local education spending by one dollar. As a result, towns where more than one dollar of property tax revenues was needed to increase spending by one dollar, that is, towns with a tax price of more than one dollar, faced an incentive to generate all local revenue for education above foundation outside of the tax system. Particularly for property owners who were ineligible for the circuit breaker exemption, it could be cheaper to contribute directly to the schools to fund a target level of spending than to pay the property taxes needed to fund that target level.

Partly in response to discontent with Act 60 in property-rich towns,[15] the act was repealed by the Vermont legislature in 2004 by the passage of Act 68. Act 68 eliminated the sharing pool and reduced tax prices for education to below one dollar in the gold towns. Thus, a major incentive to use non-tax revenues was eliminated. At the same time, Act 68 changed the tax base that could be used to generate property taxes to fund the schools. Vermont divides property into 'homestead property' and the remainder,

[14]In the 1994–1995 school year, 69 of the 248 towns in Vermont for which data were available had effective education property tax rates below $1.10 per $100 in assessed value. While the percentage of towns with effective education rates below $1.10 had undoubtedly declined by the 1997–1998 school year, the last year before the phasing in of Act 60 began, the reality remained that Act 60 forced a sizeable fraction of towns in Vermont to raise property tax rates.

[15] A lawsuit filed by the towns of Wilmington and Whitingham challenging the legality of Act 60 and the town of Killington's threat of secession from the state provide the most extreme examples of the disapproval of the property-rich towns.

referred to as 'non-homestead property.' The state defines homestead property as a principal dwelling occupied by a resident plus up to two acres of surrounding land. Act 68 removed all non-homestead property from the local tax base. Thus, any spending above foundation had to be generated from property taxes on homestead property or from non-tax sources.

Spending and Revenue across New England

Figure A1.1A

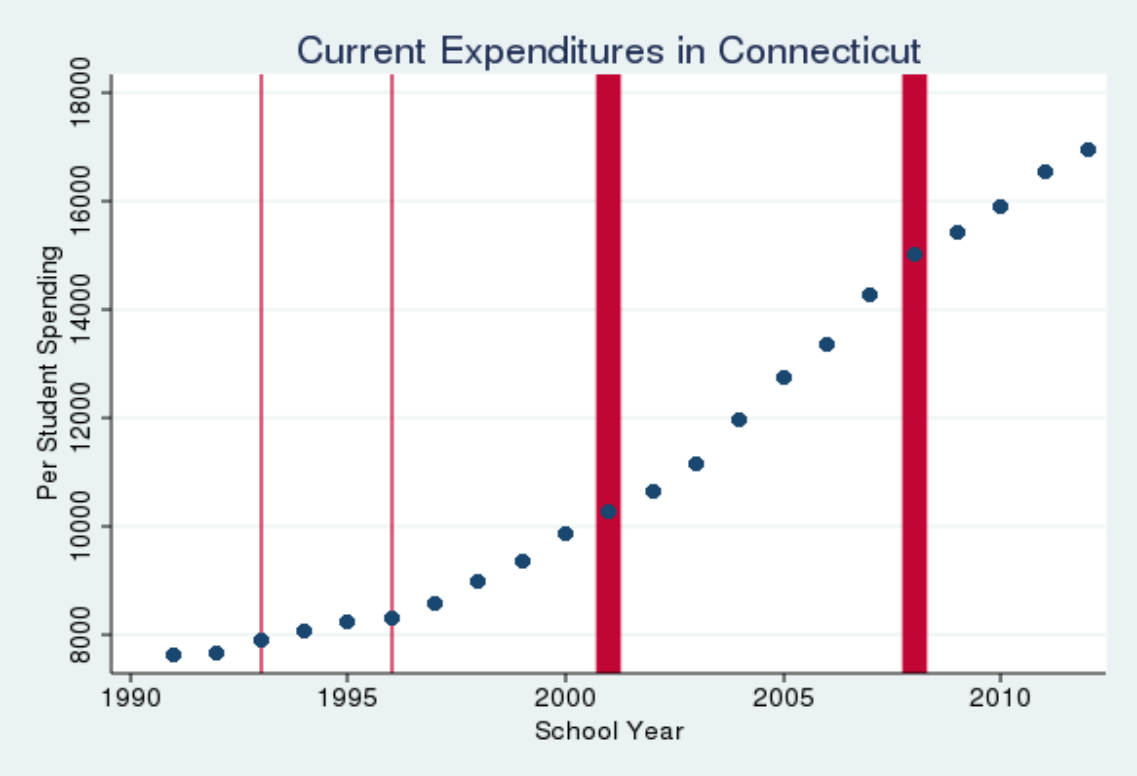


Figure A1.1B

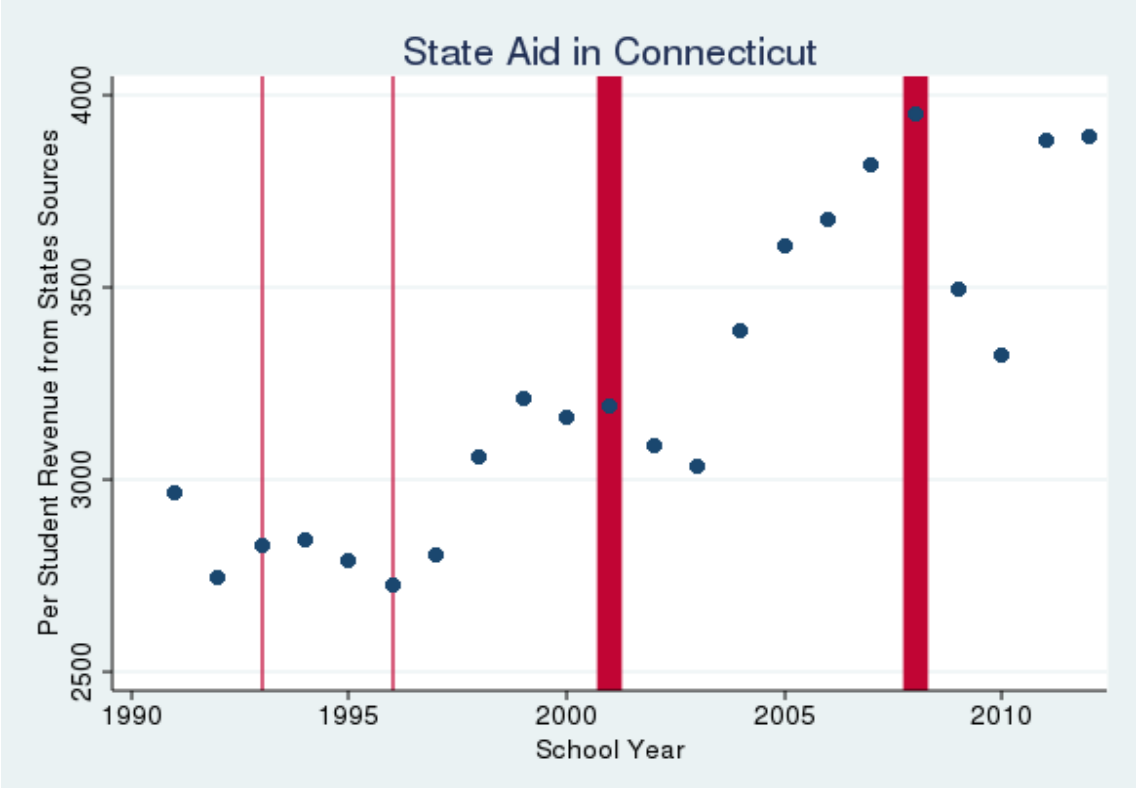


Figure A1.1C

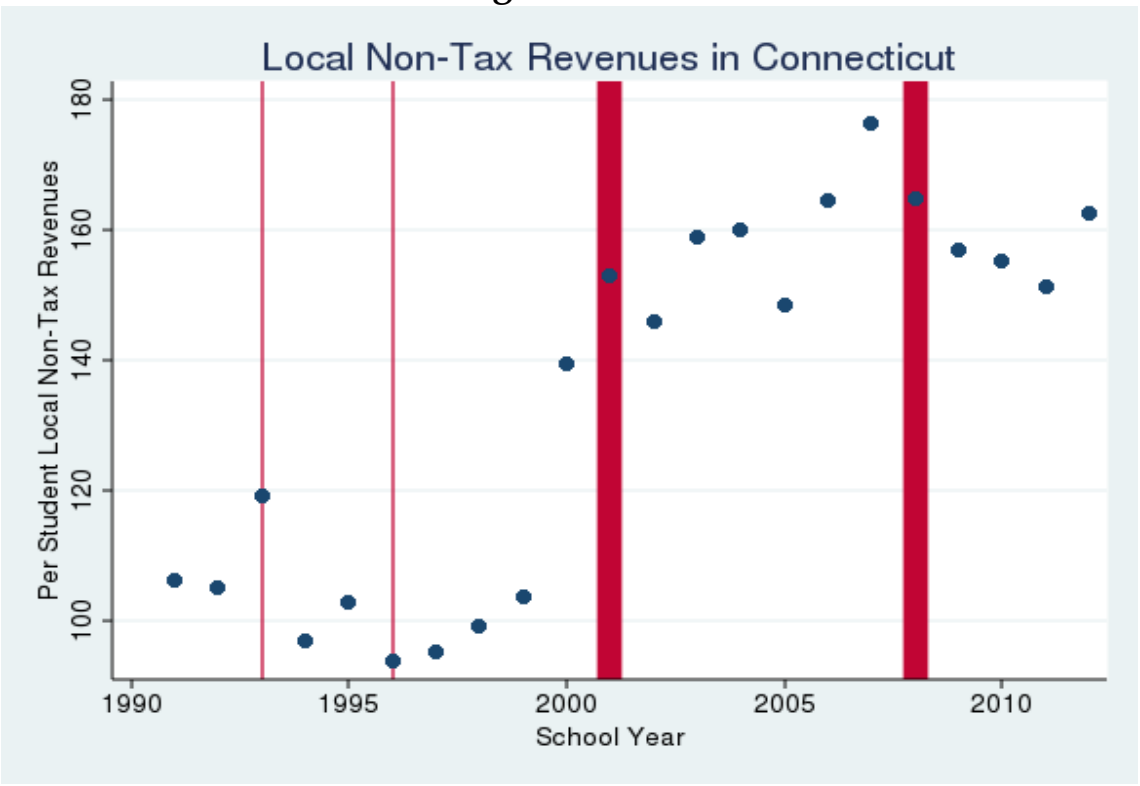


Figure A1.1D

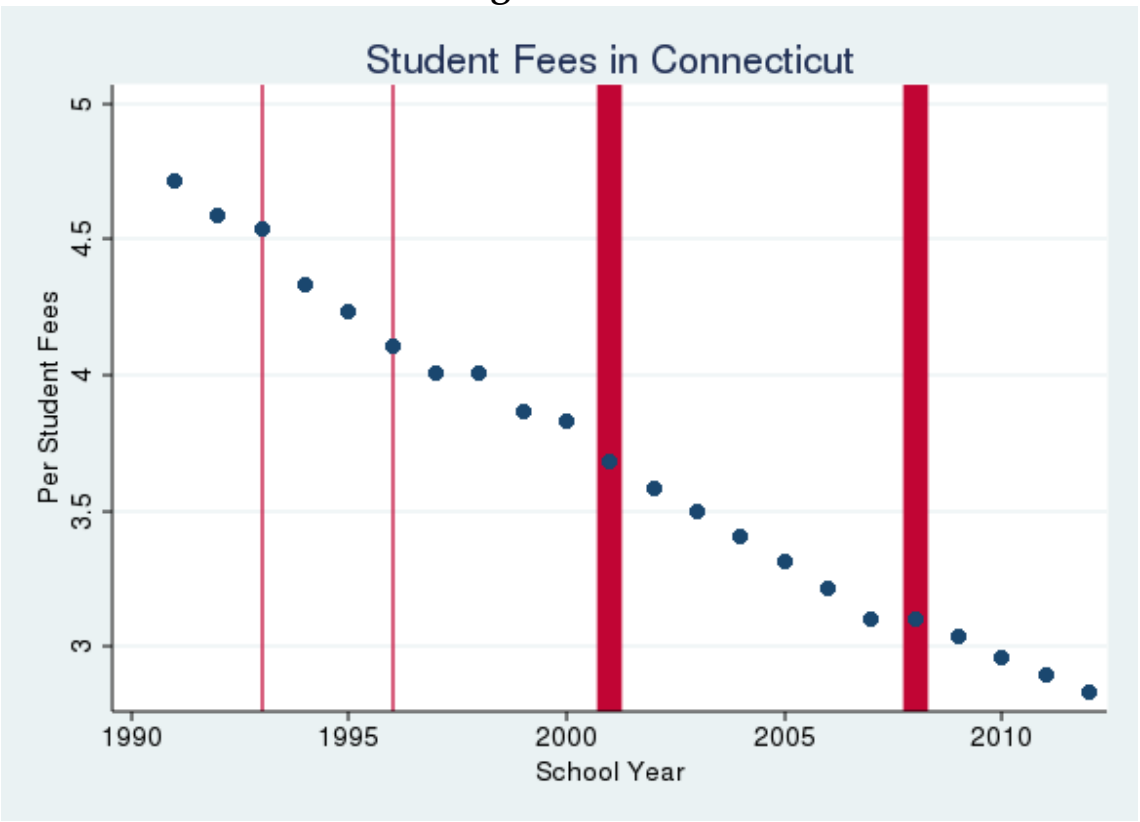


Figure A1.2A

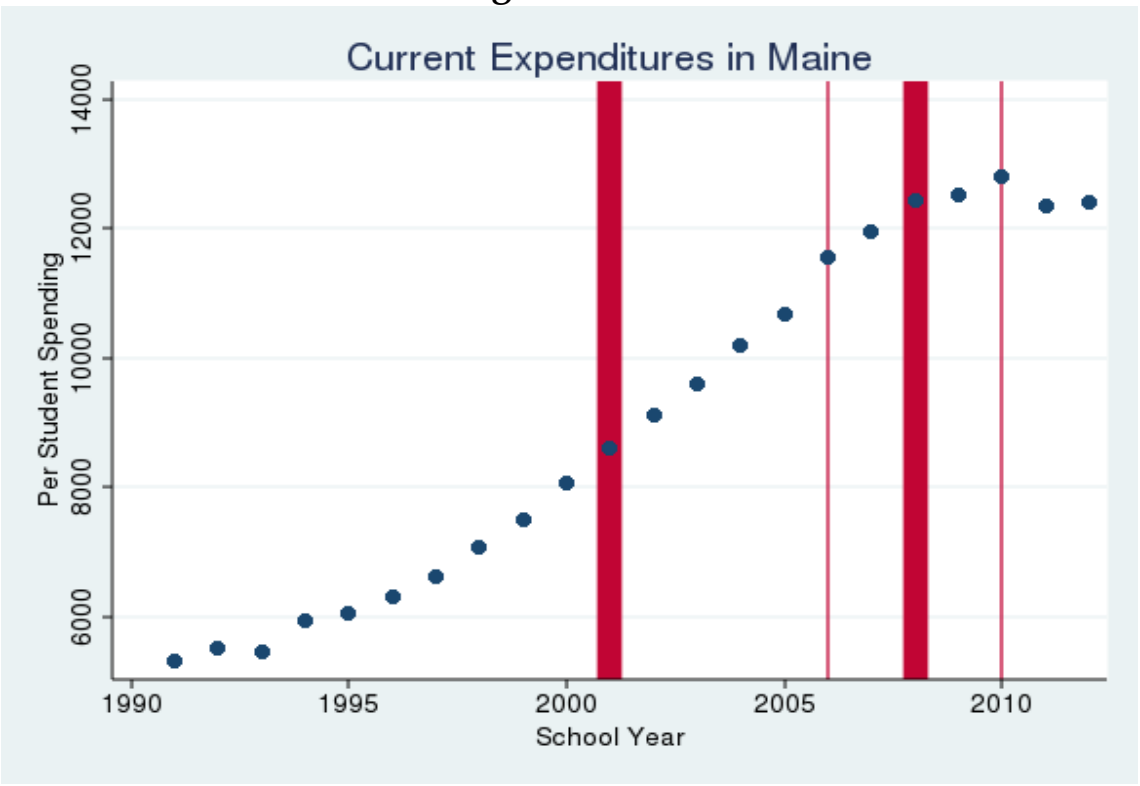


Figure A1.2B

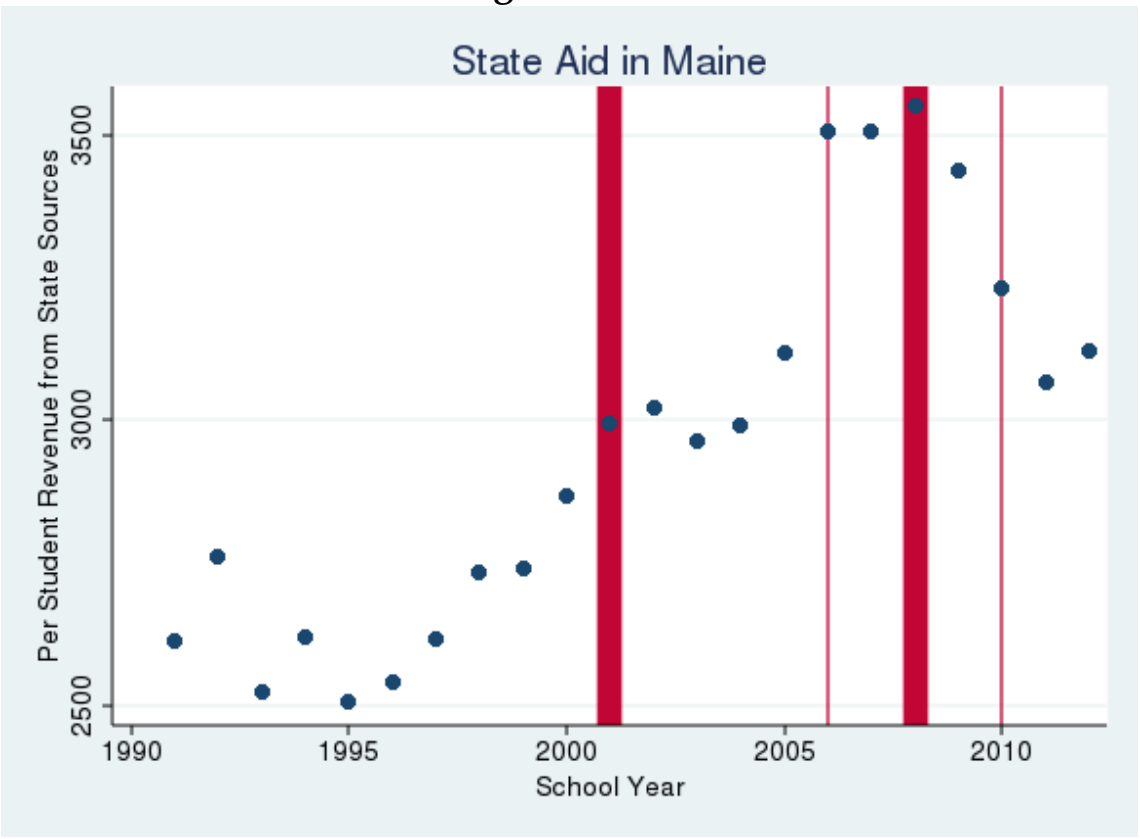


Figure A1.2C

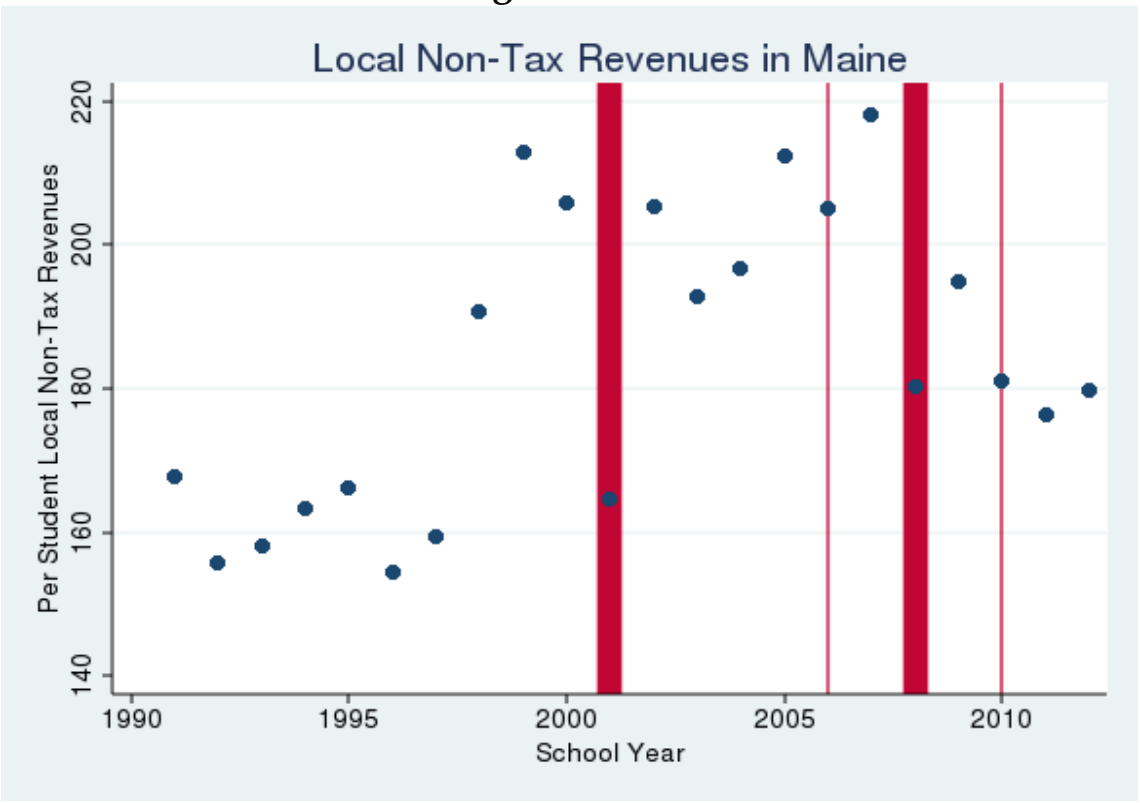


Figure A1.2D

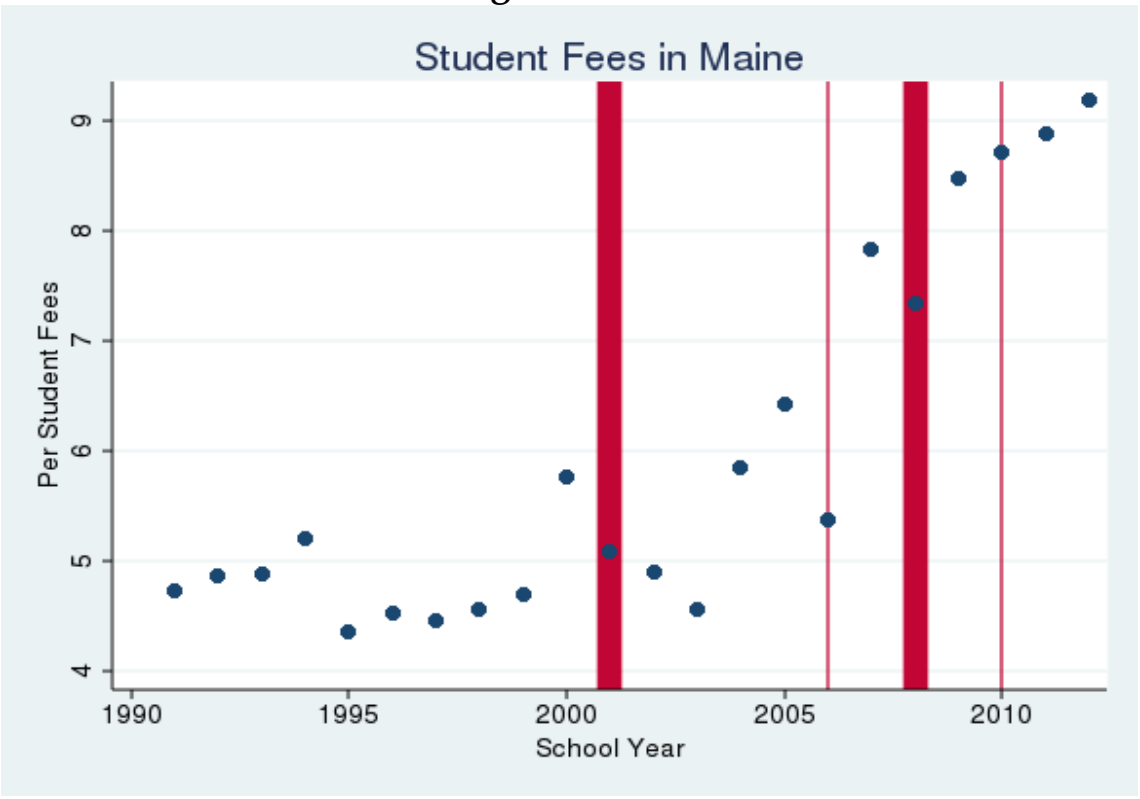


Figure A1.3A

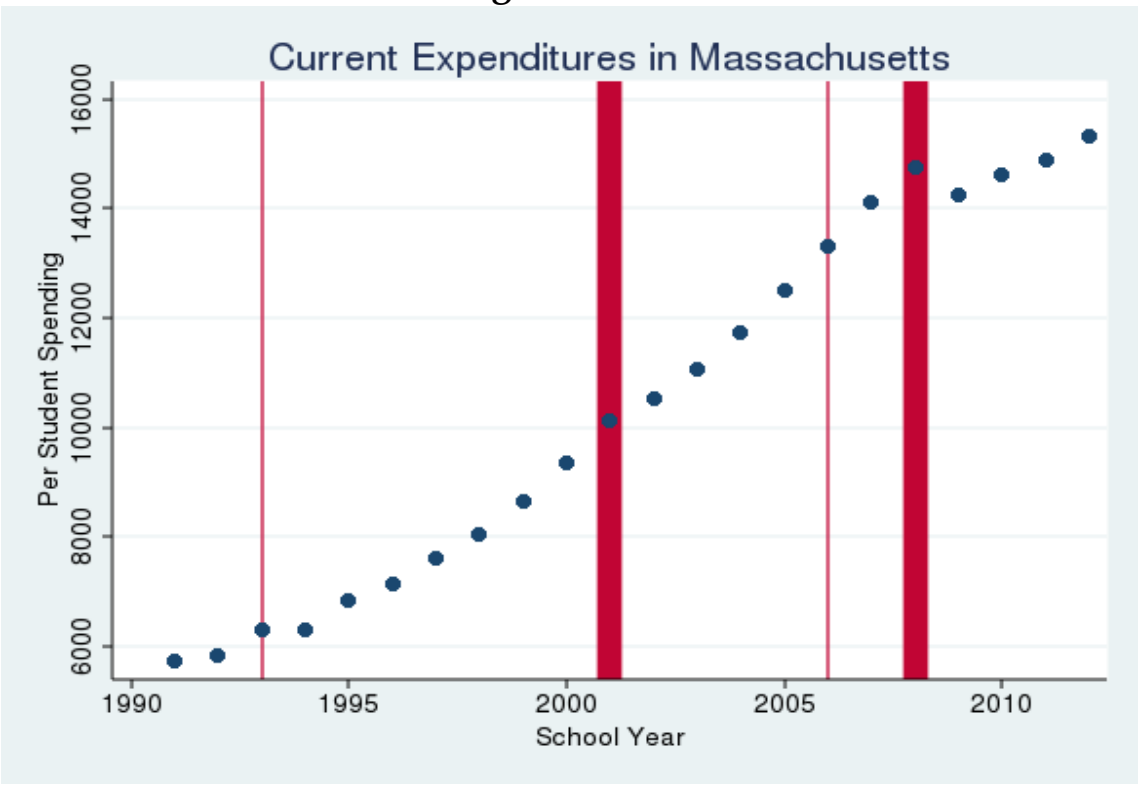


Figure A1.3B

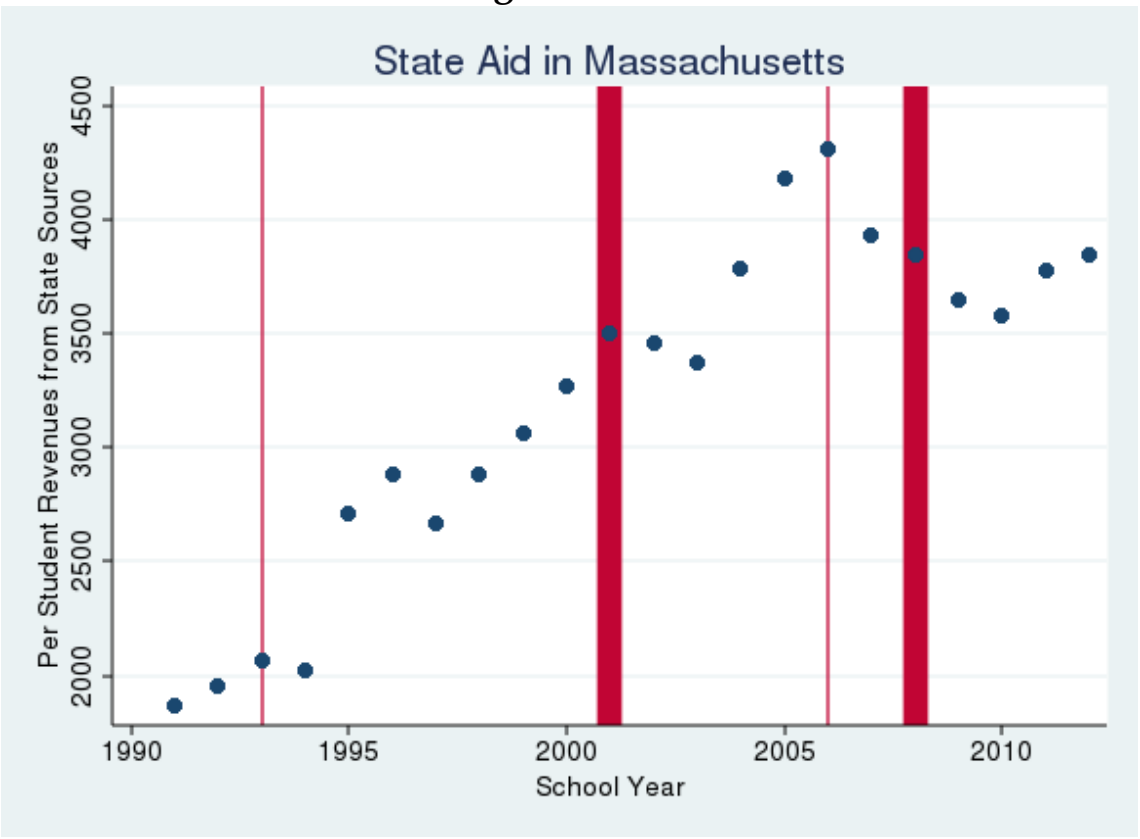
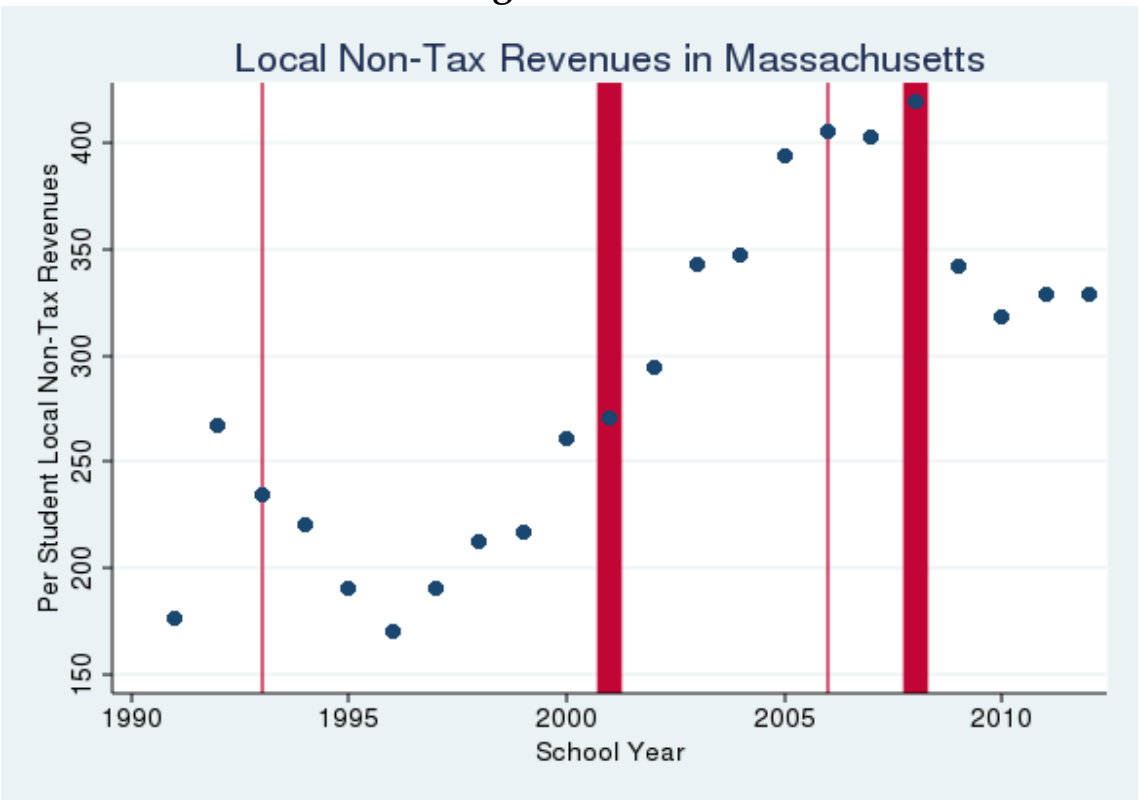


Figure A1.3C



FigureA1. 3D

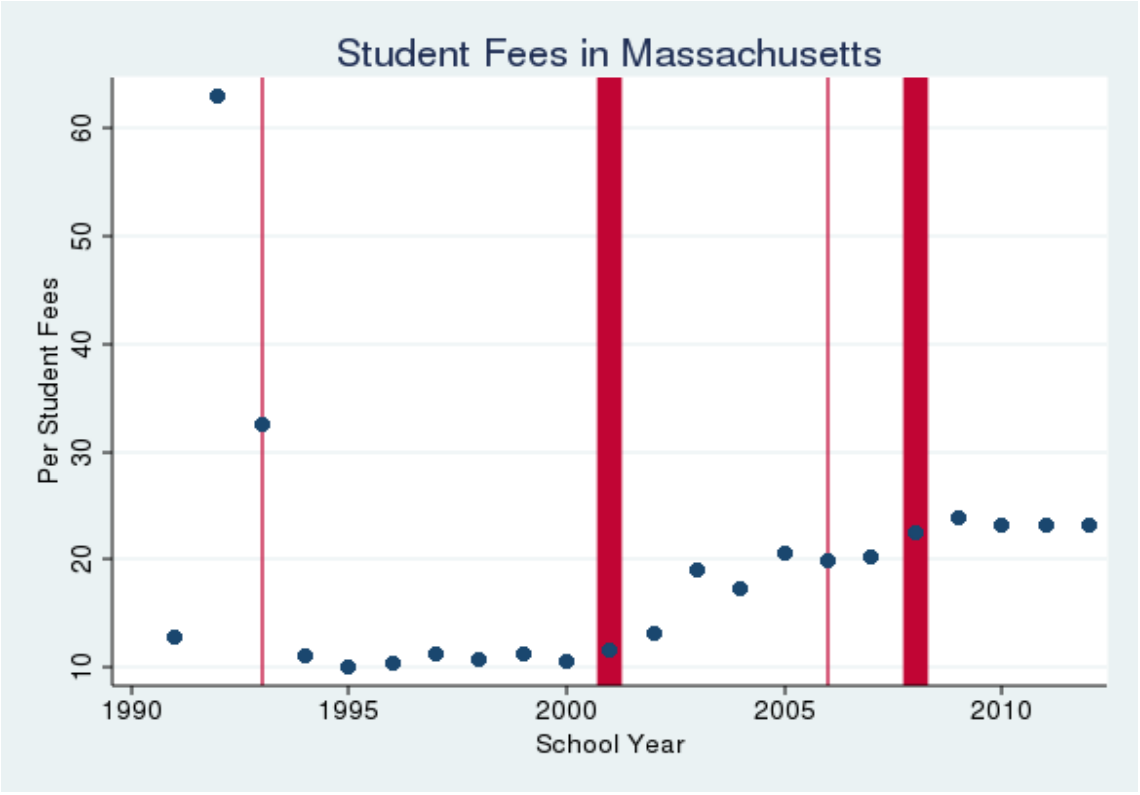


Figure A1.4A

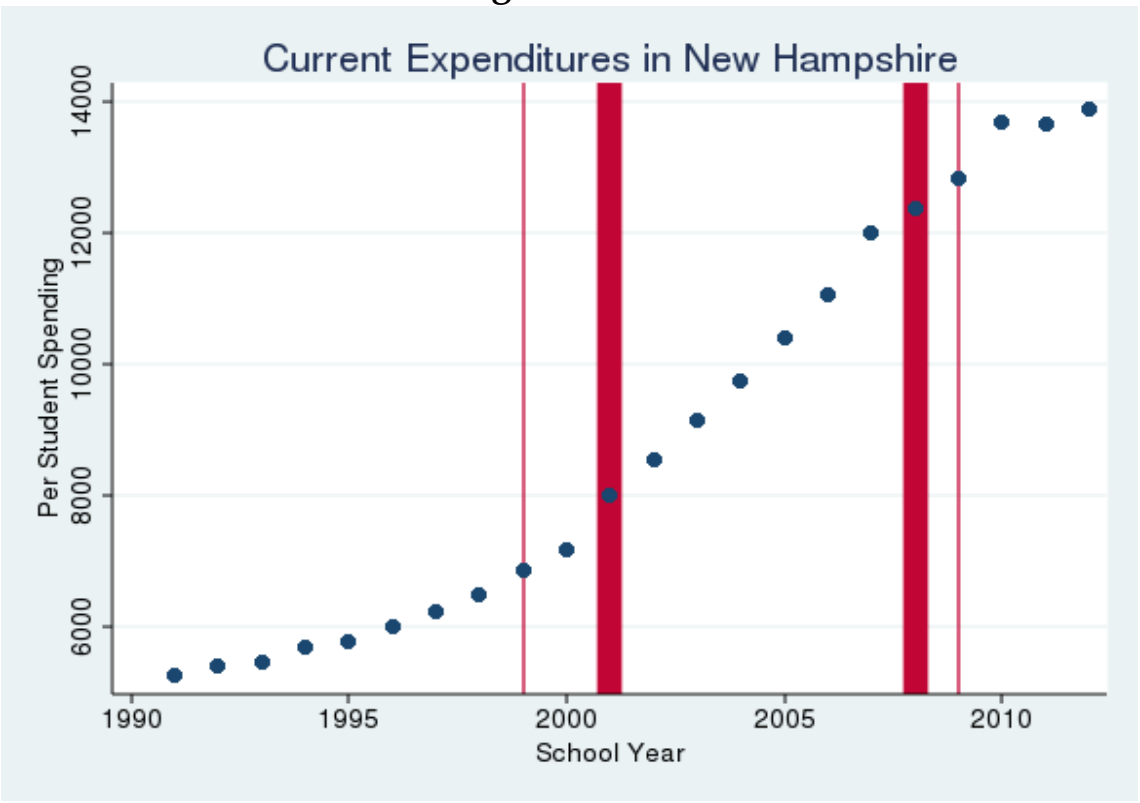


Figure A1.4B

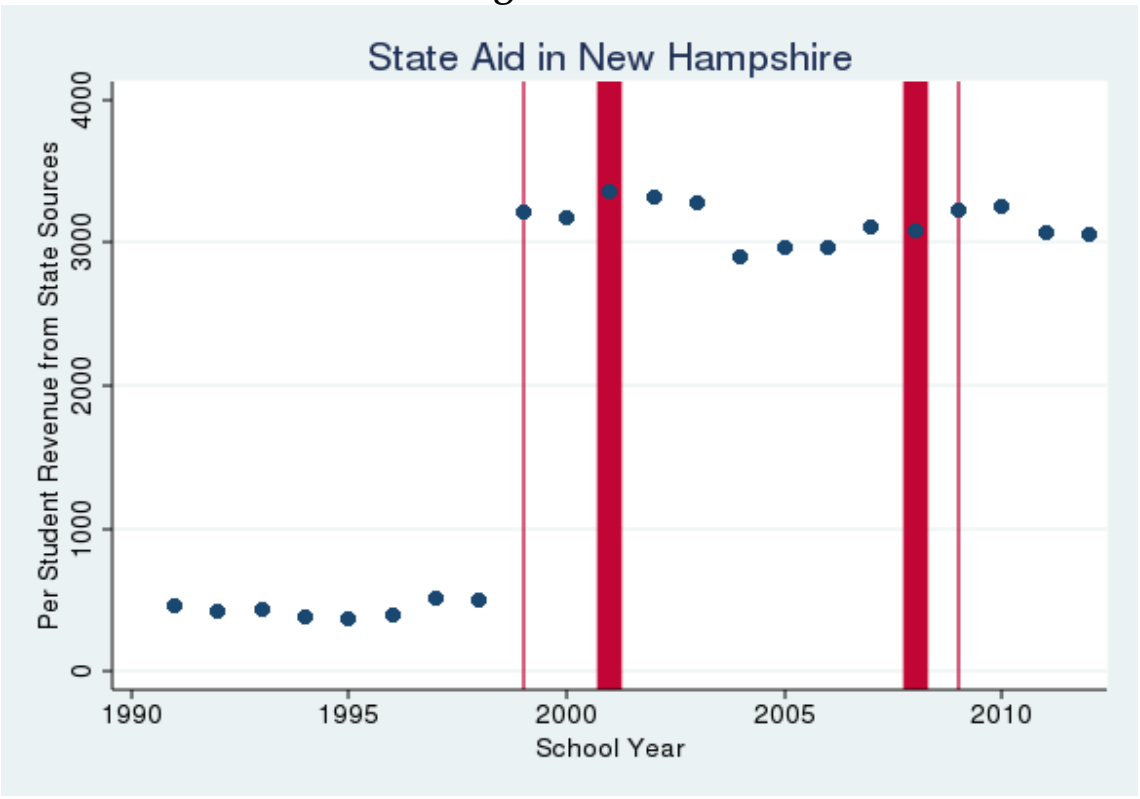


Figure A1.4C

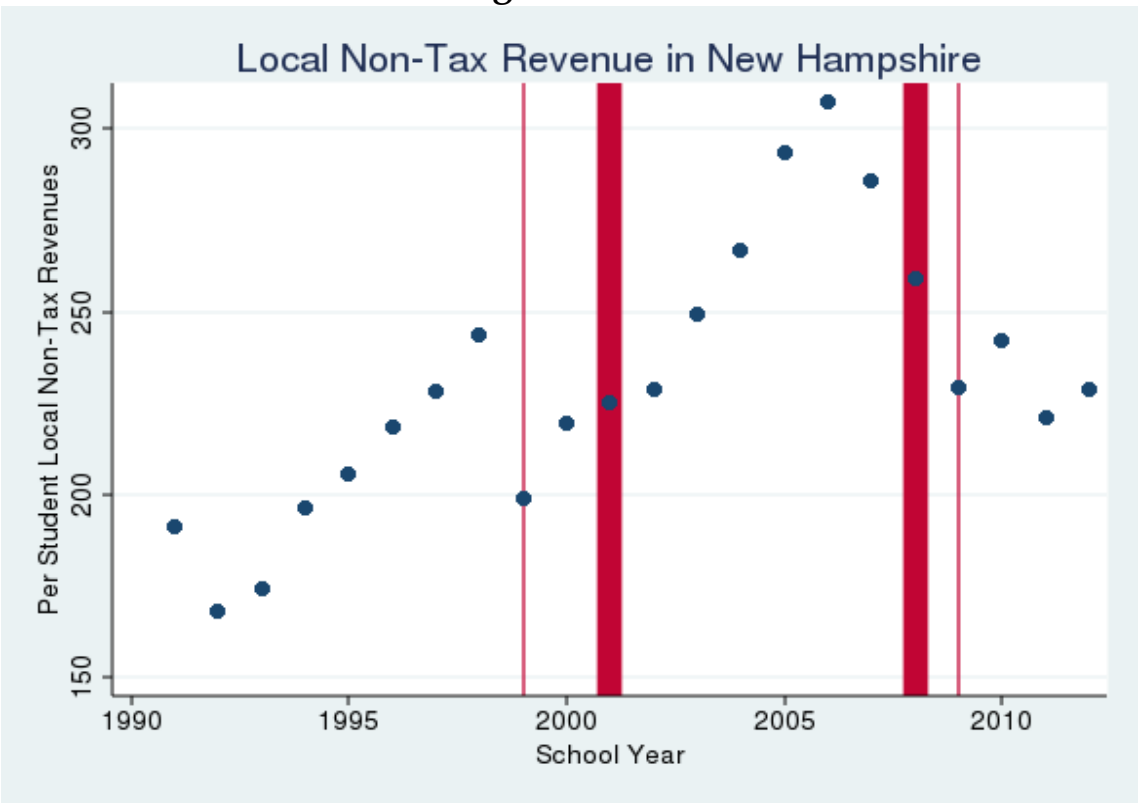


Figure A1.4D

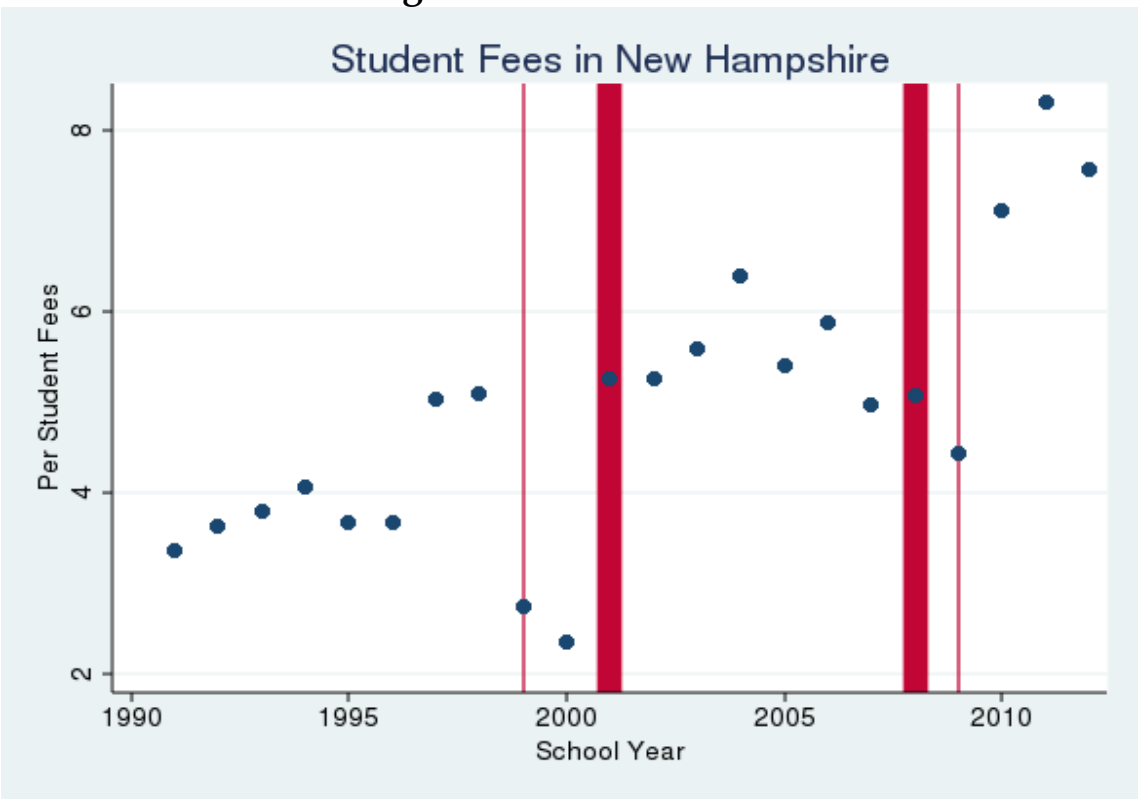


Figure A1.5A

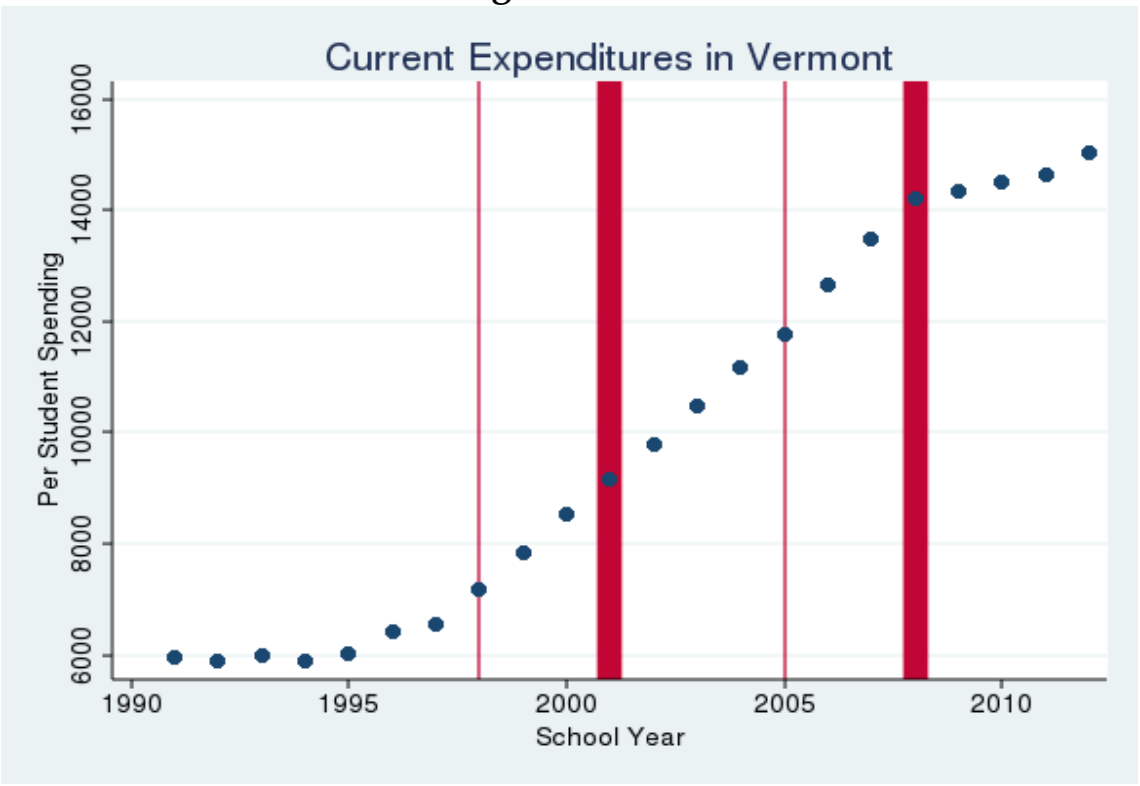


Figure A1.5B

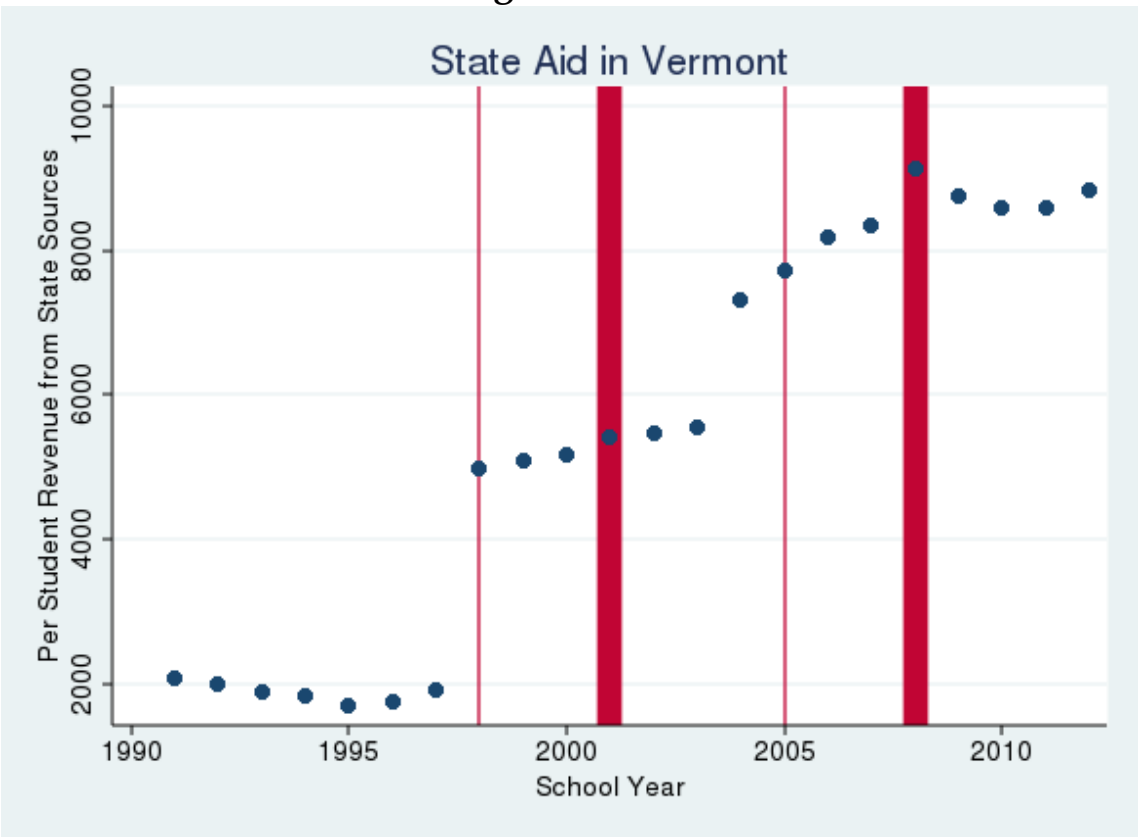


Figure A1.5C

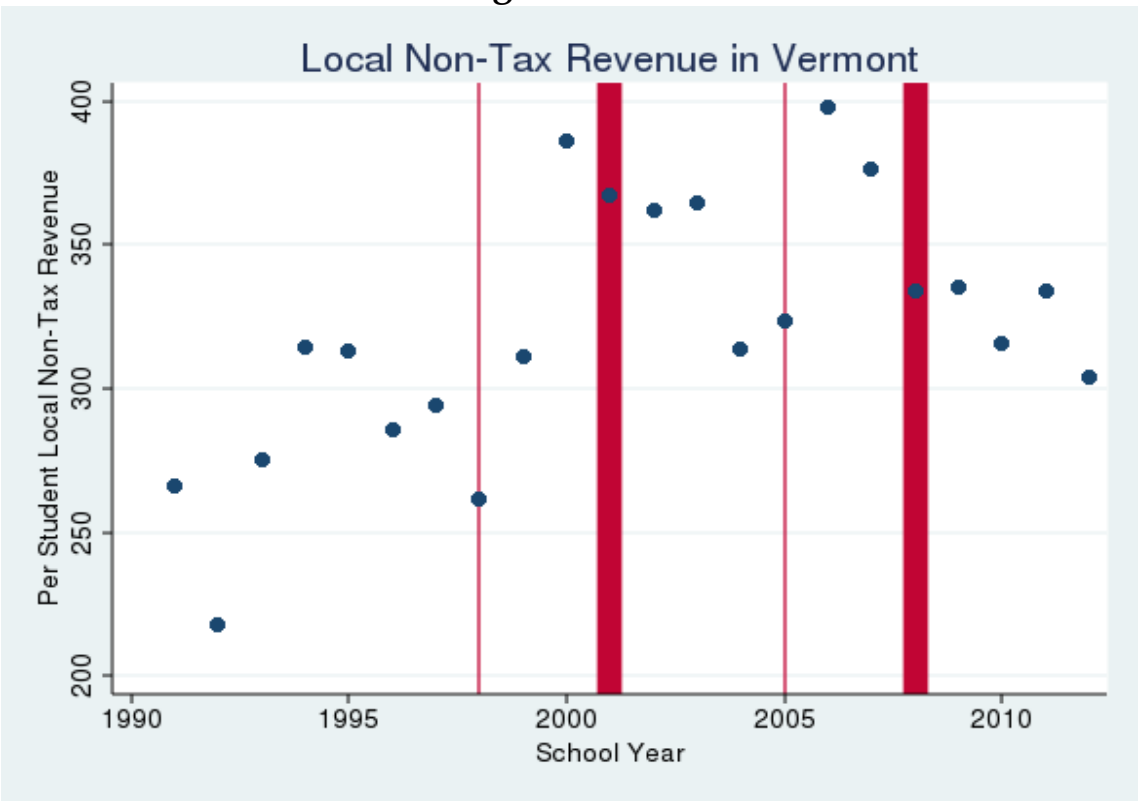


Figure A1.5D

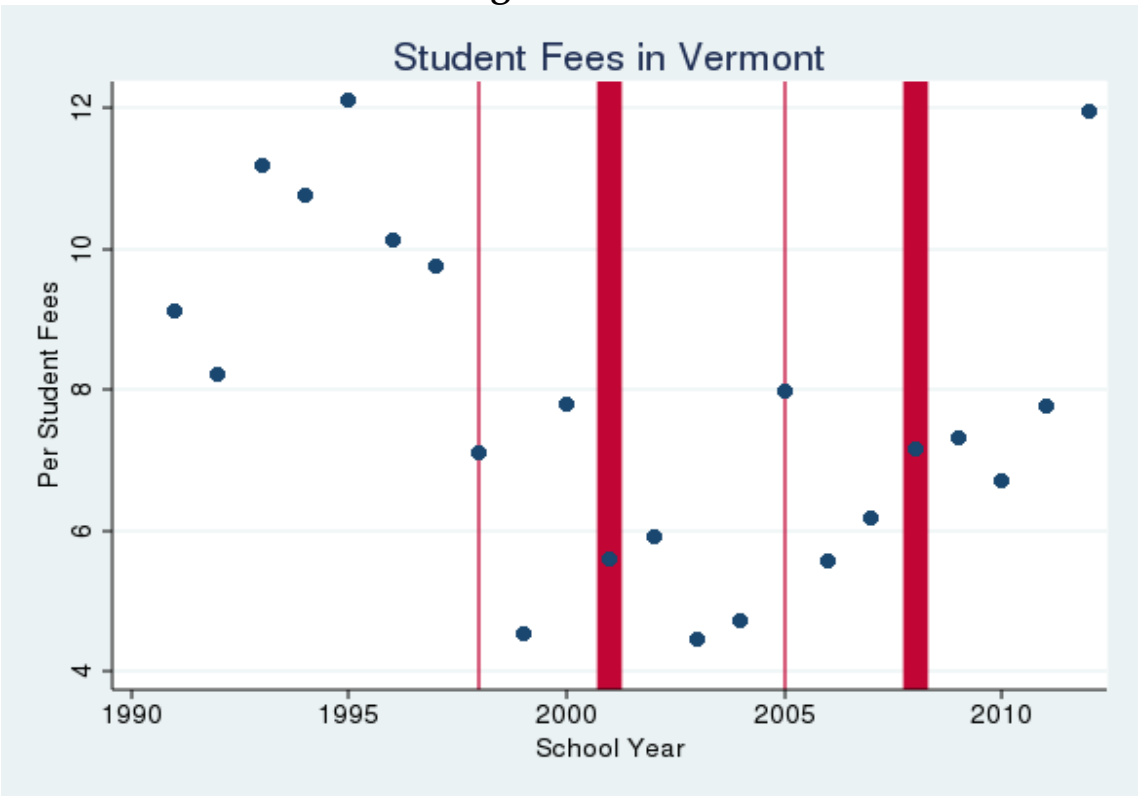


Figure A1.6A

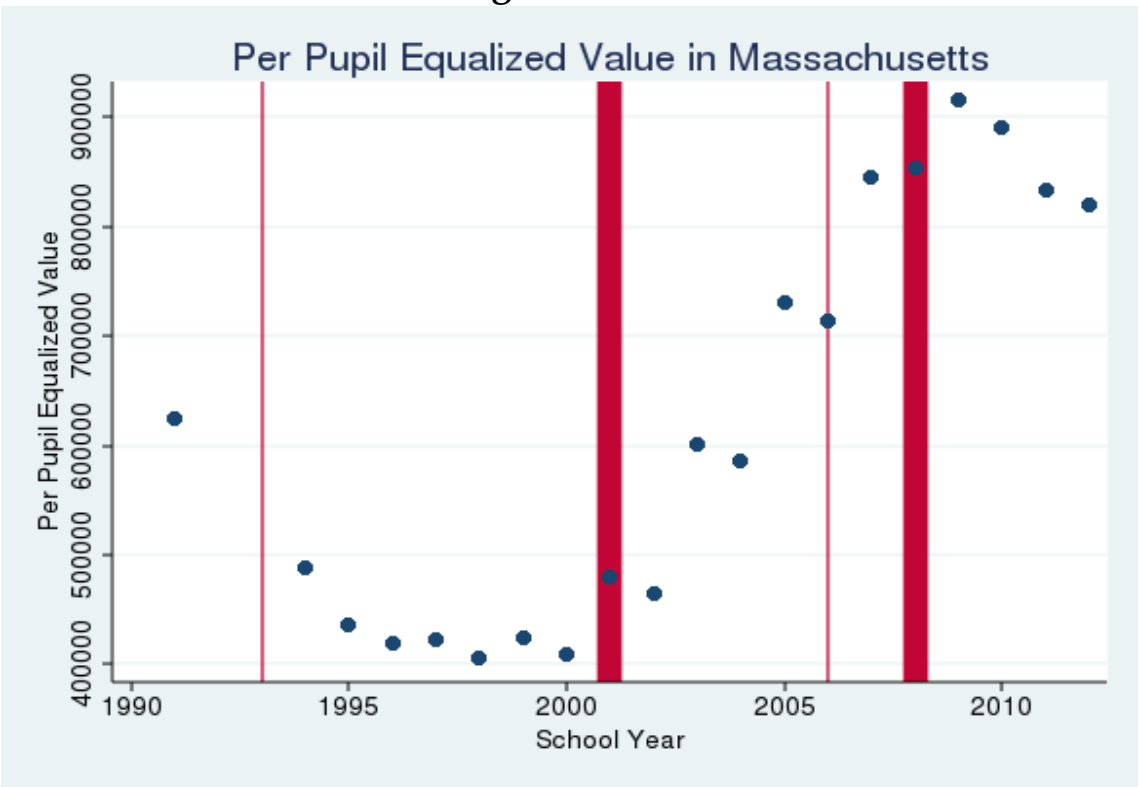


Figure A1.6B

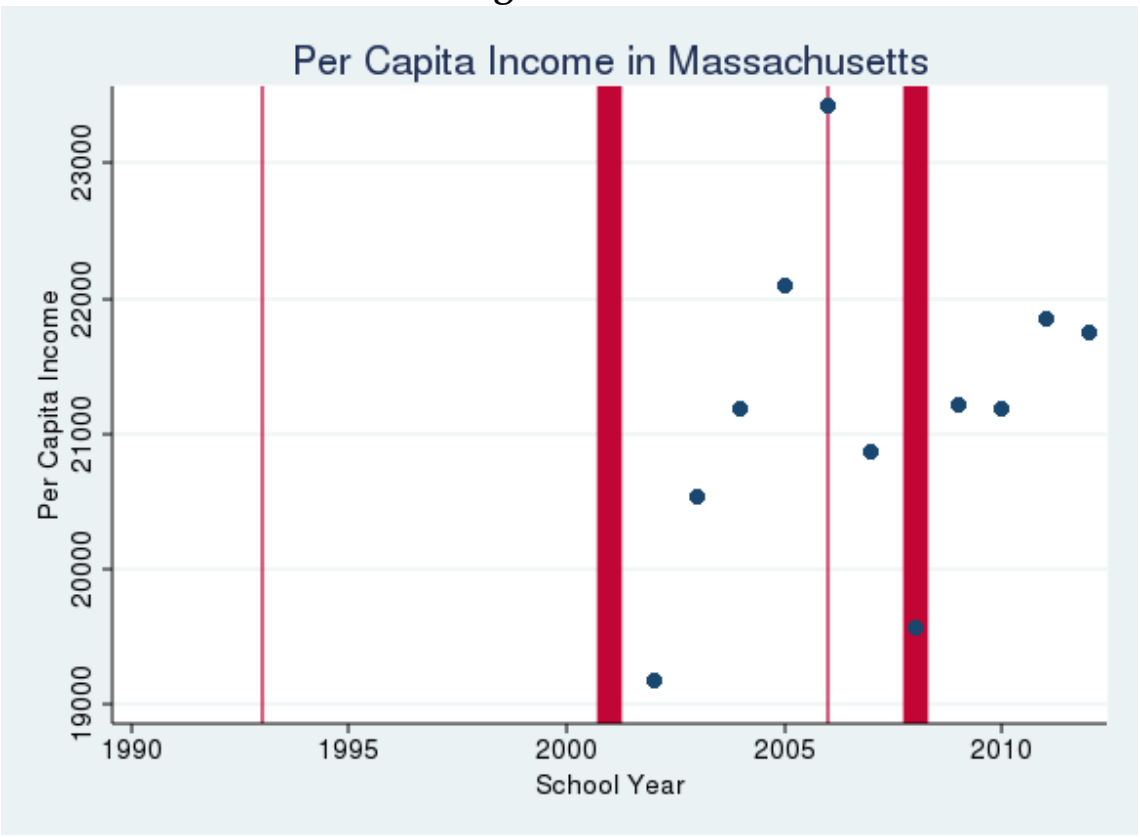


Figure A1.7A

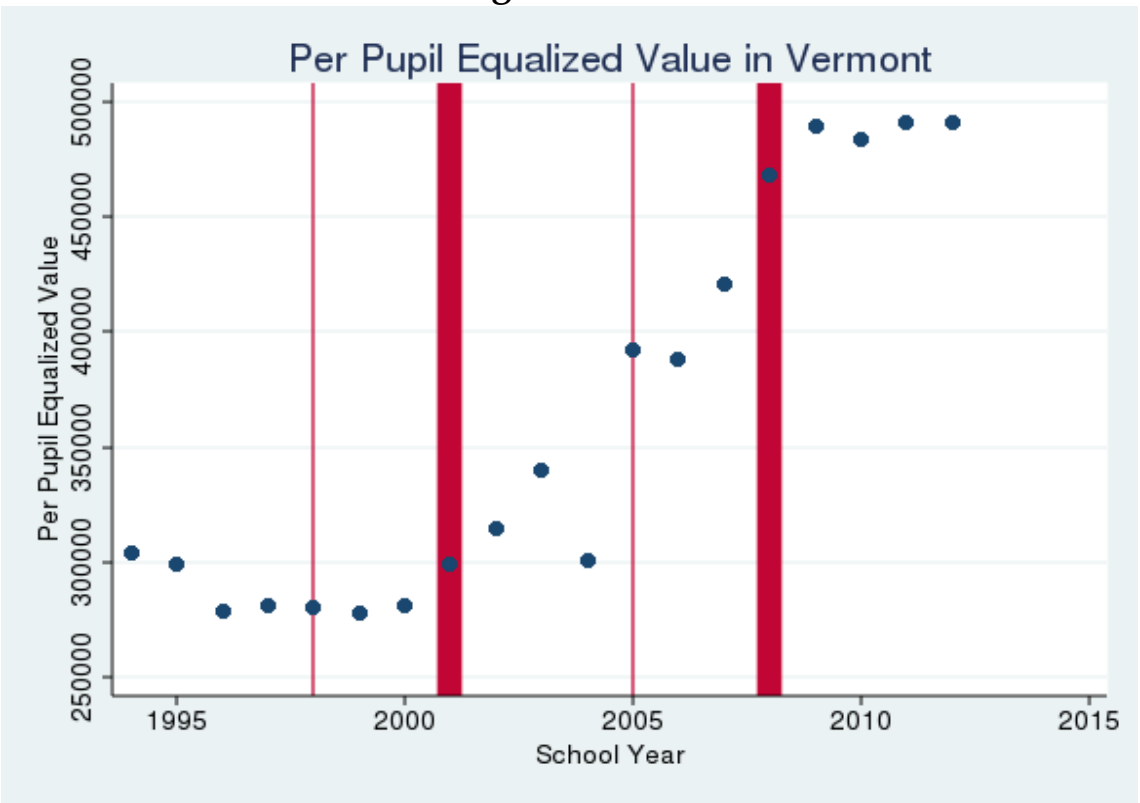
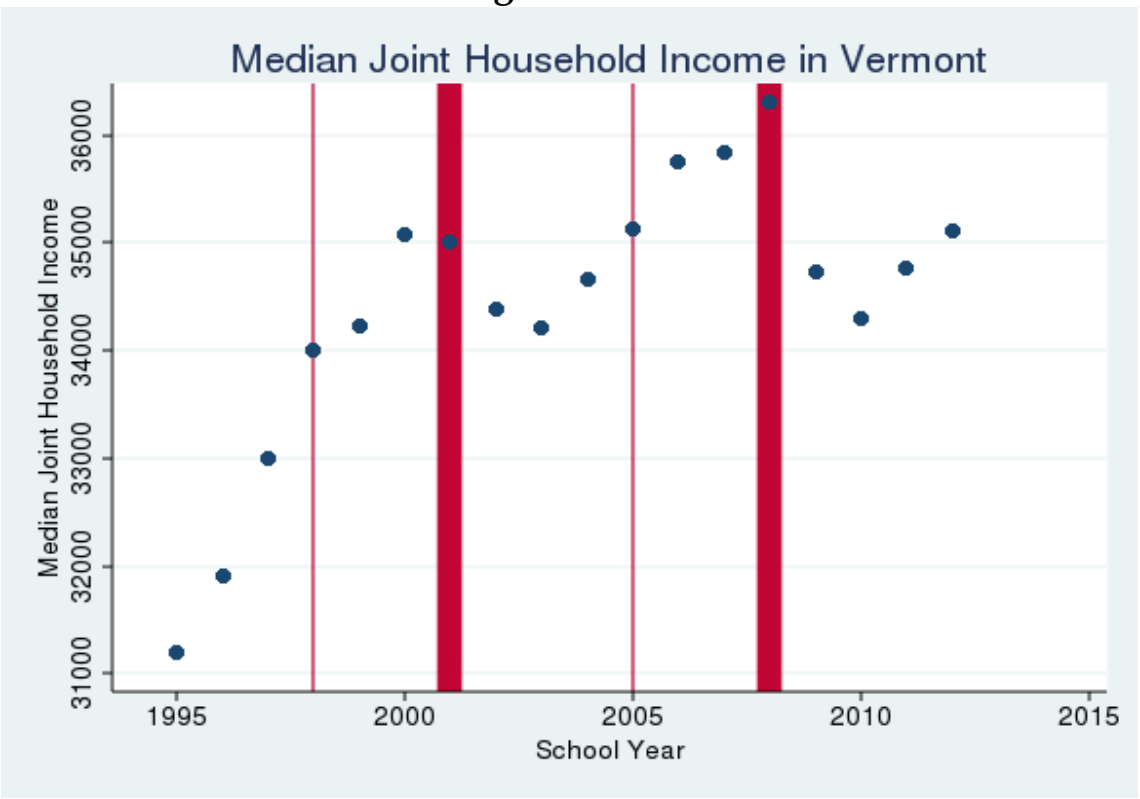


Figure A1.7B



Appendix 2: Data, Modeling Choices, and Results

The core data for this analysis are drawn from the Common Core of Data (CCD) of the National Center for Education Statistics. In fiscal year 1990, financial data collected by the Census Bureau and released as the F-33 survey became part of the CCD. However, in fiscal year 1990, no information on fees was collected. As a result, our data begin with fiscal year 1992 (school year 1991–1992). In fiscal years 1993 and 1994, the Census Bureau collected financial data for all school districts in New England, but those data have not been incorporated into the Common Core. For reasons discussed below, we omit those years from our more-detailed analyses of Massachusetts and Vermont.

We also drew from the CCD information on each district's student population. Data on racial/ethnic composition, population eligible for free lunches, and population designated as special needs were available for most states for most years; data on the population eligible for reduced-price lunches and the population of limited English proficient students became available only in the 1998–1999 school year. Where necessary, we used administrative information from the Department of Elementary and Secondary Education in Massachusetts and the Department of Education in Vermont to fill in gaps in the data on each district's students. For example, in the CCD, data on free lunch eligibility in Massachusetts became available only in 1998–1999 and was missing for 2001–2002 and 2002–2003. Administrative data on the percentage of students who were low income[16] were used instead of the fraction eligible for free lunch.

Since the CCD includes no information on the taxable property wealth or the income of residents of a school district, we also turned to administrative data for that information. For Massachusetts, these data were downloaded from the Municipal Databank of the state's Department of Revenue.[17] Income information for Vermont was

[16] A student was designated as low income if the student was eligible for free or reduced-price lunch, received Transitional Aid to Families benefits, or was eligible for food stamps.

[17] As noted above, in the 2006–2007 school year, the formula that determines state aid was modified to measure fiscal capacity using a weighted average of per capita income and equalized assessed value. Since the formula uses a lagged measure of per capita income, the first annual measure of per capita income available from the Department of Revenue is for calendar year 2003.

downloaded from the web site of that state's Department of Taxation; data on equalized value and distribution of property ownership were acquired from the Division of Property Valuation and Review of the Department of Taxation.[18]

For both states, data on income and property wealth are provided at the town level. While most school districts are coterminous with towns, not all are. As a result, crosswalks were created that enabled us to aggregate up from towns to school districts.[19] In Massachusetts, regional school districts are both academic and vocational. Only the academic regional school districts were included in the analysis.

To explore the relationship between overrides, override failure, and the use of alternative revenues in Massachusetts, we started with data from the Municipal Databank on overrides, capital exclusions, and stabilization fund overrides from fiscal year 1983 to date.[20] For each district, we then determined the date of each override vote. We created variables that indicate the year in which an override passed or failed. We also created variables that indicate whether a district has passed on override and whether a district has attempted but failed to pass an override.[21] But the limits created by Proposition 2½ are not binding on all districts. Therefore, some districts can increase revenues without passing an override. To account for this, we created a variable that indicates whether a district is at its levy limit, using Bradbury, Mayer, and Case's (1998) rule that a district is at the levy limit if its levy is greater than or equal to 99.9 percent of the levy limit. We also reset the indicators for override success or failure back to 0 once a district was no longer at its levy limit.[22]

---

[18] Thanks to Brad Jackson of the Division of Property Valuation and Review for providing Grand List data from 2004 to 2008.

[19] For Vermont, the crosswalk creation process is described in Downes (2004). For Massachusetts, the School Finance division of the Department of Elementary and Secondary Education provides lists of each town served by regional school districts.

[20] Because local non-tax revenues are used primarily to fund current expenditures, we excluded votes for capital exclusions and stabilization funds.

[21] If the voters in a district where an override has failed subsequently pass an override, we set the indicator for override failure to 0. Similarly, if after a successful override there is a subsequent failure, we set the indicator for override success to 1.

[22] Proposition 2½ applies to towns, not school districts. Therefore, the discussion above is only formally correct for school districts that are coterminous with towns. For regional districts, we aggregated up from the constituent towns to create population-weighted versions of the indicator variables. The spreadsheet

To create the measure of student fees used below, we combined four line items on the F-33 survey: transportation fees from pupils and parents, textbook sales and rentals, district activity receipts, and student fees, nonspecified. While we had hoped to create measures of district revenues from sales and from entrepreneurial activity, it was not possible to do so because in Fiscal Year 2006 the Census Bureau added to the F-33 survey items on private contributions, rents and royalties, fines and forfeits, and sales of property. Prior to that year, these items were probably part of each district's miscellaneous revenues, although some districts may have included these items in their reports of other, non-fee alternative revenue sources. As a result, we can only be confident that our measures of fee revenue and of the total of local, non-tax revenue are reported consistently in all years.

Data on each district's racial/ethnic composition, age composition, and per capita income were drawn from the Decennial Censuses of 1990, 2000, and, starting in school year 2006–2007, from the five-year extracts from the American Community Survey.

To use these data to execute statistical analyses of the determinants of non-tax revenues and the impact of policy changes on the relationship between these determinants and revenues, we need to model a district's revenue choices. The primary determinants of these choices are the attributes of the district that influence the district's public choice process, including the district's resources and demographics. In addition, we account for the potential heterogeneous effects of changes in the school finance systems by allowing the effects of certain district attributes to change after a reform. The basic form of the models we estimate is

$$(\text{revenue\_source}_{it}) = \alpha_i + \tau_t + X_{it}\beta + Z_{it}\gamma + R_t W_{it}\gamma + F_{it}\delta + \varepsilon_{it}\,, \qquad (1)$$

where $\text{revenue\_source}_{it}$ is per pupil revenues from the specified source in district i in school year t, α_i is a district-specific effect, and τ_t is a school year-specific effect.[23] The vector X_{it}

---

on overrides allowed us to distinguish between overrides for a town's elementary schools and overrides for the regional high school district of which the town is a part.

[23] We use linear models because in each year fee revenues are zero in a subset of districts in both Massachusetts and Vermont. We have, however, estimated a log-linear version of (1); the qualitative implications of those estimates are the same. We also followed suggestions in the literature indicating that

consists of attributes of each district's student population, Z_{it} consists of measures of the fiscal circumstances facing the school district, such as the per pupil equalized assessed value of the district and an indicator that the district has passed an override; R_t indicate that a new finance system is in place; W_{it} are elements of Z_{it} whose relationship with the revenue source could change under the new finance system; and F_{it} contains measures of plausibly exogenous revenue sources, such as state and federal aid.

Because attitudes toward non-tax revenues are likely to vary from district to district but change little over time, accounting for district-specific effects is critical. Other unmeasurable but temporally stable institutional factors that influence district use of fees will also be absorbed in α_i. The time effects τ_t are included to control for common year-to-year fluctuations in the dependent variable in a relatively flexible manner.

using Poisson models is an effective way to deal with zeros in the dependent variable. Again, the implications of those estimates were the same as those presented below.

Appendix 2 Table 1

Sources of Variation in Alternative Sources of School District Revenues[1] in Massachusetts
Dependent Variable: Per Pupil Revenue Measure[2]

Explanatory Variable	Fees	Alternative Revenues	Total Revenue	Fees	Alternative Revenues	Total Revenue
Enrollment/1000	3.2969* (1.6867)	-30.1879* (16.4433)	-473.5395*** (111.7800)	1.8722 (1.5463)	4.3562 (12.9668)	-454.3085*** (110.2894)
Fraction special education	20.4339** (10.2828)	-179.9036 (145.6755)	505.0412 (909.6600)	12.5897 (18.9569)	-501.3319* (228.3218)	-90.1664 (2144.383)
Percent low income	-0.2558*** (0.0966)	1.6481 (1.1326)	15.9983* (8.1952)	-0.1336 (0.1031)	0.7742 (1.0732)	25.4937** (10.1569)
Fraction Asian-American	20.5457 (42.5641)	547.3628** (255.2911)	2831.625* (1676.134)	-76.6776 (54.8544)	-43.0830 (388.8963)	-1426.516 (2605.542)
Fraction Native American	92.9015 (96.6423)	489.6577 (1088.478)	-7326.611 (11181.12)	156.4361 (188.4152)	40.1686 (1151.078)	-24515.76* (13019.19)
Fraction African-American	-14.5228 (31.9510)	-346.3948 (592.0927)	-1270.053 (2236.809)	14.6596 (49.1804)	1083.777* (543.5404)	2379.987 (3444.041)
Fraction Hispanic	-43.8206*** (12.8499)	433.8016 (592.0927)	-1868.941 (1446.357)	-42.3645** (20.3767)	104.5667 (333.5679)	-4477.824** (2058.916)
Total state aid	-0.0005** (0.0002)	0.0048 (0.0058)	0.9334*** (0.0343)	-0.0005** (0.0002)	0.0083 (0.0055)	0.9573*** (0.0369)
Federal aid	0.0009 (0.0027)	-0.2234 (0.1785)	0.5420* (0.2848)	0.0071 (0.0054)	0.0429 (0.0351)	0.7888** (0.3942)
Override passed	3.8929* (2.2339)	98.6395 (100.8783)	173.2613 (154.6799)	-1.2134 (1.9003)	-12.9695 (25.3891)	214.5845 (159.7632)
Override failed	1.6120 (1.8728)	58.0698 (66.5790)	80.1131 (114.9561)	-0.0146 (1.5395)	-11.5548 (12.6904)	65.5559 (111.0342)
No override needed	2.0480* (1.1494)	60.5258 (65.2716)	144.0217 (102.6221)	0.5394 (1.0628)	-12.2833 (10.8730)	38.5793 (112.4142)
First year after override passed	-0.0578 (2.2293)	-8.2752 (18.4776)	23.0603 (91.2853)	1.9049 (3.6169)	35.8613 (25.7471)	-92.1684 (91.1988)
First year after override failed	1.6150 (1.2290)	22.9177* (12.5612)	65.3944 (96.7149)	1.2388 (1.3765)	27.4332 (16.9125)	21.3442 (80.2409)

Equalized Value per pupil/1000	-0.0002 (0.0003)	-0.0038 (0.0067)	0.8332*** (0.0989)	-0.0029* (0.0016)	0.0303* (0.0176)	0.9914*** (0.3129)
Square of equalized value per pupil/1000				2.96e-08** (1.27e-08)	-4.30e-07*** (1.53e-07)	1.16e-06 (2.61e-06)
Share commercial, industrial, personal	0.0213 (0.1621)	0.5307 (2.1660)	15.5662 (14.8917)	0.0805 (0.1813)	-3.2979 (2.0539)	-32.3879 (24.5733)
Per capita income/1000				-0.3691 (0.2463)	-0.2170 (2.4486)	-7.1007 (14.5870)
Square of per capita income/1000				0.0034*** (0.0011)	0.0160* (0.0090)	0.0182 (0.0685)
Unemployment Rate	0.3367 (0.4073)	-1.8019 (7.7307)	-124.3835** (63.0530)	0.2122 (0.5814)	-13.8299** (6.3492)	-148.9589** (70.3160)
Interaction of 2006 reform indicator with:						
Equalized Value per pupil/1000				0.0025 (0.0018)	-0.0028 (0.0133)	-0.0370 (0.1771)
Square of equalized value per pupil/1000				-8.37e-08 (7.96e-08)	-3.25e-07 (9.28e-07)	-0.00002** (8.56e-06)
Per capita income/1000				0.5723** (0.2362)	3.1207** (1.5607)	13.2020 (12.5545)
Square of per capita income/1000				-0.0046*** (0.0011)	-0.0227** (0.0101)	-0.0474 (0.0694)
Unemployment Rate				-0.0462 (0.3899)	5.5219 (7.6116)	40.9131 (101.0113)
Observations	5635	5635	5635	3251	3251	3251
Districts	304	304	304	302	302	301
Within R^2	0.1073	0.1423	0.7580	0.0681	0.0634	0.7820
F-statistic	5.62	17.10	198.54	---	1350.85	15246.66

Note: 1) All regressions include district-specific fixed effects and year effects.

2) In parentheses are standard errors robust to heteroskedasticity and calculated by clustering by school district.

* significant at 10 percent level, ** at 5 percent level, *** at 1 percent level .

Appendix 2 Table 2

Sources of Variation in Alternative Sources of School District Revenues[1] in Vermont

Dependent Variable: Per Pupil Revenue Measure[2]

Explanatory Variable	Fees	Alternative Revenues	Total Revenue	Fees	Alternative Revenues	Total Revenue
Enrollment/1000	2.8745 (13.5348)	-174.4135 (258.4014)	-5220.868*** (1125.182)	1.9693 (17.0671)	-114.5421 (314.3539)	-4931.107*** (1224.873)
Fraction special education	-----	-----	-----	-12.9133* (6.7510)	122.0906 (114.0143)	1441.419** (603.6843)
Fraction eligible for free lunch	3.1426 (3.7415)	-36.6014 (71.3954)	-218.3361 (487.5821)	6.0332 (4.3831)	-80.3065 (86.3559)	-399.7804 (520.0358)
Fraction Asian-American	-69.2870 (62.7673)	1629.285 (964.4441)	-14072.78* (8492.572)	-92.0111 (72.5770)	1239.569 (1108.471)	-14309.71 (10519.00)
Fraction Native American	5.7274 (12.6331)	108.1949 (319.0766)	-511.7381 (1915.909)	4.5128 (20.3434)	92.8249 (471.2878)	-1006.714 (1965.795)
Fraction African-American	-9.5811 (35.6150)	-49.8364 (696.0152)	3852.212 (5356.990)	-6.9164 (45.1147)	34.2603 (832.7173)	5571.341 (5620.852)
Fraction Hispanic	5.7640 (5.7754)	-65.2873 (130.9118)	-830.6288 (909.2519)	5.7896 (5.5604)	-64.5738 (107.3308)	-360.6188 (601.0928)
Total state aid	0.0002 (0.0001)	0.0100*** (0.0027)	0.7043*** (0.0251)	0.0002 (0.0002)	0.0075** (0.0030)	0.6732*** (0.0418)
Federal aid	0.0035* (0.0018)	0.0669 (0.0445)	0.8734*** (0.2262)	0.0056* (0.0028)	0.0479 (0.0508)	0.9211*** (0.2483)
Municipal Equalized Value per pupil/1000	-0.0134 (0.0084)	-0.2961*** (0.1053)	2.4368** (1.2259)	-0.0150* (0.0088)	-0.3395*** (0.1259)	2.2701** (1.1416)
Share of property that is homestead	0.0166 (0.1659)	-3.0432 (2.8015)	-46.8032** (20.6483)	0.0362 (0.1878)	-4.7361 (3.2826)	-47.7241*** (18.0560)
Share of property commercial, industrial	0.0251 (0.1846)	-0.9862 (3.3870)	-46.3458** (18.8316)	0.0087 (0.2263)	-1.6585 (3.6729)	-37.8382** (16.2745)
Median income of household	-0.2122 (0.2400)	-1.4830 (4.4579)	-127.8430*** (42.2623)	-0.3158 (0.2752)	-4.9074 (6.0202)	-131.0809*** (41.5368)

(joint filers)/1000						
Unemployment Rate	-0.1136 (0.1789)	-2.6944 (2.6414)	-42.5929** (18.5415)	-0.1610 (0.2292)	-3.8703 (3.4804)	-49.8208** (23.7447)
Interaction of Act 60 reform indicator with:						
Municipal Equalized Value per pupil/1000	0.0135* (0.0075)	1.1960*** (0.1647)	-1.1593 (1.0424)	0.0139* (0.0078)	1.2350*** (0.1683)	-1.0939 (0.9764)
Share of property that is homestead	0.2023* (0.1110)	0.2289 (2.0175)	44.4937*** (13.4468)	0.2209* (0.1149)	0.1194 (2.1115)	42.3323*** (12.6655)
Share of property commercial, industrial	-0.0655 (0.1448)	-0.6191 (2.6943)	31.7198*** (12.1323)	-0.0784 (0.1500)	-1.0101 (2.7132)	28.5748** (11.9801)
Interaction of Act 68 reform indicator with:						
Municipal Equalized Value per pupil/1000	0.0120 (0.0075)	0.0909 (0.0793)	-2.7198** (1.2070)	0.0111 (0.0077)	0.1434 (0.0913)	-2.4233** (1.1000)
Share of property that is homestead	0.2030* (0.1173)	-1.7339 (1.5500)	17.5785 (117.1867)	0.2113* (0.1244)	-0.9998 (1.7013)	21.8131 (16.7237)
Share of property commercial, industrial	-0.0080 (0.1410)	-2.1527 (1.5611)	20.8284 (16.8878)	0.0386 (0.1475)	-2.0140 (1.7322)	21.6894 (17.3183)
Observations	4201	4201	4201	3184	3184	3184
Districts	249	249	249	248	248	248
Within R^2	0.0167	0.2216	0.7893	0.0232	0.2185	0.7794
F-statistic	1.38	11.76	240.25	1.59	10.25	173.46

Note: 1) All regressions include district-specific fixed effects and year effects.

2) In parentheses are standard errors robust to heteroskedasticity and calculated by clustering by school district.

* significant at 10 percent level, ** at 5 percent level, *** at 1 percent level .