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## The long road to recovery: New York schools in the aftermath of the great recession

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Federal Reserve Bank of New York  
Staff Reports

# The Long Road to Recovery: New York Schools in the Aftermath of the Great Recession

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# **The Long Road to Recovery: New York Schools in the Aftermath of the Great Recession**

Rajashri Chakrabarti and Max Livingston

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## **Abstract**

Schools play a crucial role in human capital development, and were one of the many elements of government adversely affected by the Great Recession. Using a rich panel data set of New York State school districts and a trend-shift analysis, we examine how the funding and expenditure dynamics of districts have changed in the four years since the recession hit. We find that although the stimulus prevented major cuts to expenditures while it was in place, once the stimulus funding was used up districts faced strong budget constraints and made deep cuts to their expenditures. While state and local funding continue to be below trend, the role of funding schools has shifted more to local governments because of a cutback in state and federal aid. Breaking up expenditure into its primary categories, we see that instructional spending was preserved with the help of the stimulus money in 2010, but by 2012 instructional expenditure experienced a statistically and economically significant downward shift. We also examine heterogeneities in the effects by metropolitan area, looking at the major MSAs of New York. We find that Nassau sustained the largest cuts, while Buffalo sustained the smallest. These findings are instructive in that they shed light on how recessions and fiscal policy can affect school finance dynamics, and provide important lessons/insight for future policy and experiences of schools in financial distress.

Key words: school finance, recession, ARRA, federal stimulus

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## **1 Introduction**

When the Great Recession hit, the impact was severe and wide-reaching. More than five years after the housing bubble burst, the effects are still reverberating throughout the economy. The implosion of the housing market and spike in unemployment led to declines in property, income, and sales tax revenue for federal, state, and local governments. State and local governments faced tough decisions about how to balance their budgets; many were forced to slash funding for a wide variety of programs and services. The federal government stepped in to bolster local governments by passing a large stimulus package, but after those funds were spent and the economy was still weak, both state and local governments were forced to make cutbacks. One key public institution that was affected by these funding cuts was our nation's school system.

State and local governments generally provide the vast majority of public school funding, so schools were particularly vulnerable to their fiscal problems. To reinvigorate the economy and prevent serious budget cuts, the federal government passed the American Recovery and Reinvestment Act (ARRA). One of ARRA's components was an allocation of \$100 billion to states for education spending, beginning in the fall of 2009. New York received \$5.6 billion in ARRA funding as well as \$700 million from the Race to the Top Competition. The stimulus was meant to help maintain funding in the short-term, while the economy improved and states could provide for themselves again. After a massive influx of money in 2009-2010 school year, the federal stimulus has also started to dry up. On the other hand, the recovery from the Great Recession has taken longer than many anticipated. The toll of the sluggish economy was felt in most sectors of the economy, and schools were no exception.

Schools are a vital part of our economy and our society. They are crucial in building human capital and shaping the nation's future. It is necessary to understand how the Great Recession and its aftermath affected schools and what, if any, repercussions it might have on how students are educated. Focusing on the state of New York, in this paper we study how school finances in NY were affected under the Great Recession. Did the federal stimulus succeed in staving off cuts in school finances? How did school finances fare when the stimulus wound down? It should be noted here though that this study solely pertains to school finances in these districts and educational outcomes (or any other outcomes) in these districts are beyond the scope of this paper.

New York is particularly of interest because it contains New York City, the country's largest school district. Additionally, New York is the third largest state school system, serving 5.5% of the nation's students.<sup>4</sup> New York is also a very diverse state, with a range of urban, rural, and suburban districts and a wide distribution of income levels, which makes studying New York more interesting and instructive.

Using detailed data on school finance indicators and their compositions and a trend shift analysis, we examine the above questions and discover some interesting patterns. We find that the stimulus aid prevented severe cuts to school funding and expenditure, but as the stimulus money dried up and the economy was still weak, districts faced revenue shortfalls and made major cuts to expenditures. In particular, districts were forced to cut instructional expenditure, the category most fundamental to student learning. This is in sharp contrast to the initial years

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<sup>4</sup> Authors' calculations using NCES CCD 2012 (<http://nces.ed.gov/pubs2012/2012327.pdf>)

after the recession when the districts maintained instructional spending by cutting back on non-instructional spending. These results indicate that the impact of the Great Recession is still being felt throughout the economy.

Separate analysis by metropolitan areas reveals some intriguing patterns. Albany, New York City, and Nassau experienced particularly sharp declines in funding. We see that in cutting non-instructional expenditures different metropolitan areas chose different categories to cut—for instance, Rochester had large negative shifts in pupil services while maintaining or increasing instructional support and Nassau had positive shifts in pupil services while making deep cuts to utilities, transportation, and instructional support. Ultimately, most metropolitan areas sustained widespread cuts, indicating just how tight budgets were. Our findings promise to increase our understanding of what effect large recessions have on schools and how government policies can play a role.

We must note here a caveat to our analysis. We use a trend shift analysis, in which we calculate a pre-recession trend for each indicator and then investigate whether there was a shift from the trend in each post-recession year (2009-2012). Shifts in the year just after the recession (2009) indicate the immediate effects of the recession and the shifts in 2010 and 2011 capture the combined effect of the recession and federal stimulus. The effects in 2012 capture the relatively longer term effects of the recession when the federal stimulus had virtually eroded. However, our estimates will be biased if there were shocks during the post-recession years that affected our financial indicators independent of the recession. Thus, we consider our estimates to be strongly suggestive but not necessarily causal. This caveat should be kept in mind while interpreting the results of this paper. However, we conducted an extensive search to look for such potentially

confounding “shocks” and did not find any evidence. Moreover, the Great Recession was not a marginal shock, but rather a large and discontinuous shock. So even if there were small shocks during these years they would be by far overpowered by as substantial a shock as the Great Recession and the effects obtained are likely to capture its effects.

This paper contributes to the literature that studies school district funding. Stiefel and Schwartz (2011) analyze school finance patterns in New York City during the Bloomberg era and find evidence of large increases in per pupil funding during this period. Rubenstein et al. (2007), studying schools in NYC, Cleveland, and Columbus, find that higher poverty schools received more funding per student. Baker (2009), studying schools in Texas and Ohio, find that districts with greater student needs receive a greater allocation of resources.

But this paper is most closely related to the literature that studies the impact of recessions on schools. Reschovsky and Dye (2008) analyze the effect of changes in state aid per capita on changes in property taxes during the 2001 recession. They find that state funding cuts were associated with increased property tax funding, partially offsetting the cuts in state aid. Thus although there is research on school funding and resource allocation within and across districts, there is only a very sparse literature on the impact of recessions on schools, and even less on the Great Recession specifically. In fact, this is the first paper to study the impact of the whole sequence of events associated with the Great Recession—the onset of the recession, the federal stimulus, and the cutback of the stimulus—on school finances. Studying the impacts in the later years is especially instructive as it captures the full brunt of the recession with the state and local economy still facing deep budget cuts while the federal support had almost receded. By improving our understanding of how school districts fared during the Great Recession, we hope

to improve the overall understanding of schools' financial situations and budgetary decision-making under fiscal duress, and the role policy can play.

## **2 Background**

### **2.1 Financial Crisis and Federal Stimulus Funding**

The bursting of the housing bubble and the onset of the recession in 2007 strained state and local government finances as their revenues slowed. The housing market began slowing in 2005 and 2006, as foreclosures increased. In 2007, as dozens of subprime lenders declared bankruptcy and credit for home equity loans dried up, the housing market crashed. According to the CoreLogic Home Price Index, the U.S. as a whole saw a 29.4% drop in housing values from October 2006, before the crash, to February 2009, right before the market started to recover. The decline in New York was less drastic, at 13.5%. Local governments, which often receive a large percentage of funds from property taxes, faced falling revenues due to declines in the housing market.

State governments also saw a decline in funds due to lowered income tax revenues as a result of increased unemployment and lowered sales tax revenues from lower consumption. New York's unemployment rate increased from 4.6% in 2006 to a peak of 8.5% in 2010, faring better than the nation, which had the same unemployment rate in 2006 and 9.6% unemployment in 2010.<sup>5</sup> Since that peak, unemployment has fallen to 7.4% nationally and 7.5% in New York in July 2013.<sup>6</sup>

State tax revenues fell 8% in New York from 2007 to 2009, similar to the national state average, which declined 9%. State tax revenues across the country have since climbed out of that trough, with New York's revenues growing by 11% from 2009 to 2012.

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<sup>5</sup> Bureau of Labor Statistics, Haver Analytics

<sup>6</sup> July 2013, Source: Bureau of Labor Statistics/Haver Analytics



The financial downturn limited state and local governments' ability to fund school districts and resulted in difficult budgetary decisions. According to the Center on Budget and Policy Priorities, at least 46 states and the District of Columbia worked to close budget shortfalls entering the 2011 fiscal year. Most states spend at least half of their budget on education, resulting in serious implications for K-12 education. To stave off serious budget cuts, the federal government allocated \$100 billion to states for education through the American Recovery and Reinvestment Act (ARRA). The funds were available for the 2009-10 school year through the fall of the 2011.

The ARRA money lessened the impact of decreased state and local funding on school budgets. ARRA provided approximately \$5.6 billion to New York Schools.<sup>7</sup> This money was spread out over a period of three years. New York received approximately \$2.05 billion in 2009-10 in ARRA funds, and another \$2.01 billion in 2010-11 from ARRA and Education Jobs funding. The Education Jobs Fund is a grant award passed as part of ARRA with a targeted purpose of creating or retaining school jobs. The revenue from the ARRA and Education Jobs dwindled to \$0.72 billion in 2011-12. Districts were directed to use the ARRA funds to save and create jobs, to boost student achievement and bridge student achievement gaps, and to ensure transparency, reporting, and accountability. The funds were distributed using the states' formulas for distributing education aid. New York won an additional \$700 million from the Race to the Top Competition for the 2010-11 school year to fall of 2014.

## **2.2 School Funding Overview**

Funding for public schools comes from three main sources, the federal government, state aid, and local revenues. Prior to the financial crisis in the 2007-08 school year, New York State

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<sup>7</sup> These estimates include State Fiscal Stabilization Funds, Title I Part A – Supporting Low-Income Schools, IDEA Grants, Part B & C – Improving Special Education Programs, and Education Technology Grants. This number does not include competitive grants such as Race to the Top. Source: <http://www2.ed.gov/policy/gen/leg/recovery/state-fact-sheets/index.html>

districts received approximately 3% of their funding from federal aid, 40% from the state, and 57% from local revenue. By 2009-10, reliance on federal aid increased to approximately 7% and the percent of aid from state and local sources fell to 38% and 55% respectively. By 2012, the federal government was providing 4% of district revenue, on average, with the state providing 38% and local funding contributing 58%. The majority of federal school aid goes to Title I funding to support low-income student and funding for students with disabilities. In New York, the State General Fund, financed mostly by state income and sales taxes, contributes approximately 68% of state aid. The School Tax Relief Program (STAR), which provides state-funded property tax relief for homeowners, contributes approximately 20% to state aid. The remaining 12% is funded from the Special Revenue Fund account supported by lottery receipts (The State Department of Education, 2009). State aid is determined based on a variety of characteristics of the school districts, including enrollment, varying regional labor market costs, low income students, limited English proficient students, and income wealth of the district.

In New York 90% of local revenues come from residential and commercial property tax revenue. The largest school districts, consisting of Buffalo, New York City, Rochester, Syracuse, and Yonkers, do not use property taxes, instead funding their schools from their city's budgets. Philanthropic contributions provide a very small fraction of some school districts' budgets. In New York City, the Fund for Public Schools, foundations, alumni, parent organizations, and private philanthropists provide some funding, typically for trials of education programs. These outside funds contributed only 1.3% of NYC school funding in 2007 (Stiefel and Schwartz 2010).

New York City, which makes up about half of the New York State student population, has undergone important funding policy changes in recent years. The Children First initiative, which started in 2003, increased teacher salaries and provided financial incentives for teachers to work

in high-need schools and in subject areas with teacher shortages (Goertz et. al 2011). The Fair Student Funding program, passed in 2008, aimed to improve the distribution of resources by allocating school funding based on the number of low income, special education, low achieving, and English Language Learners. According to some, but not all measures, this policy resulted in increased spending on students with greater needs (Stiefel and Schwartz 2011).

### **3 Data**

We utilize school district financial report (ST3) data from the New York Office of the State Comptroller. The data covers the 2004-05 to 2011-12 school years and 696 school districts of New York State. Student racial demographic data and the percent of students on free or reduced lunch from 2005 to 2012 are available from the New York State Department of Education. In the rest of the paper we refer to school years by the year corresponding to the spring semester.

The school finance dataset includes funding, expenditure, and enrollment information, as well as components of funding and expenditure. We have data on total revenue, the amount of aid received from federal, state, and local aid, as well as property tax revenue. The dataset includes the total fall student enrollment. In addition to total school district expenditure, detailed data are available on the various components of expenditure: instructional expenditure, instructional support expenditure, student services, transportation, and utilities and maintenance. The instructional expenditure category includes teachers' salaries, instructional training, curriculum development, equipment and textbooks, and other teaching-related expenditures. Instructional support expenditures category contains school food programs, school library and audiovisual programs, employment preparation instruction, and computer assisted instruction. Social work, counseling, guidance, and health services comprise student services expenditures category. Transportation expenditures include all student transport costs, and student activities

expenditures include all extra-curricular activities and sports. Utility and maintenance expenses category includes operating expenses such as supplies, utilities, insurance, professional and technical services, rent or lease costs, operation, and maintenance. The definitions of the categories are summarized in Table 1.

This paper first analyzes the impact of the crisis and federal stimulus across all districts. Then it delves deeper, and examines heterogeneities by different metropolitan areas. We consider the following metro areas: Buffalo, Rochester, Syracuse, New York City, and Nassau. The first three are Metropolitan Statistical Areas (MSA). While New York City and Nassau County comprise one MSA, due to their differences, we study them separately as the New York – White Plains, and Nassau County Metropolitan Divisions. Each metro area is a collection of school districts--- Buffalo includes 42 school districts, Nassau includes 118 districts, NYC includes 57, Rochester includes 58, and Syracuse has 43. We utilize GIS mapping technology to visualize changes in financial variables across the state. The district and MSA shape files come from the Census. See Figure 1 for a map of the areas we examine.

#### 4 Empirical Strategy

We analyze whether the recession and federal stimulus periods were associated with shifts in various school finance indicators from their pre-existing trends. We use the following specification for this purpose:

$$Y_{it} = \alpha_1 T + \alpha_2 v_1 + \alpha_3 v_2 + \alpha_4 v_3 + \alpha_5 v_4 + \alpha_6 X_{it} + f_i + \varepsilon_{it} \quad (1)$$

where  $Y_{it}$  is each financial indicator for school district  $i$  in year  $t$ ;  $t$  is a time trend variable which equals 0 in the immediate pre-recession year (2007-08) and increases by 1 for each subsequent year and decreases by 1 for each previous year;  $v_1 = 1$  if year = 2009 and 0 otherwise;  $v_2 = 1$  if year = 2010 and 0 otherwise;  $v_3 = 1$  if year = 2011 and 0 otherwise;  $v_4 = 1$  if year = 2012 and 0

otherwise;  $X_{it}$  represents the school district demographic characteristics—racial composition and percentage of students eligible for free or reduced price lunches;  $f_i$  denotes district fixed effects.

The coefficient on the time trend variable,  $\alpha_1$ , denotes the overall trend in the financial indicator in the pre-recession period. The coefficients on the year dummies,  $\alpha_2$ - $\alpha_5$ , represent the intercept shift from the trend in the respective years.

All financial variables are inflation-adjusted to 2012 dollars. All regressions control for demographic and socio-economic variables (percent African-American, percent Hispanic, percent Asian, percent American Indian, and the percent receiving free or reduced-price lunch), and use robust standard errors that are adjusted for clustering by school district. The results are robust, though, to the inclusion or exclusion of covariates.

Note that the post-recession shifts in the above regressions represent actual shifts of the corresponding inflation adjusted financial variables. However, for easier interpretation and for comparison of the effects across various variables we also express these in percent shift terms. In this method, the effects are expressed as percentage of the pre-recession base of the corresponding dependent variable. This not only enables us to compare the effects across variables, but also gives an indication of the size of the effect. The percentage shift in 2009 thus captures the effects of the recession, the shifts in 2010 and 2011 capture the combined effect of the recession and stimulus in those years, with the shift in 2012 capturing the aftermath (when the state and local funding were still tight and the federal stimulus had mostly receded).

An important caveat relating to the above strategy should be mentioned here. The estimates from the above specification capture shifts from the pre-existing trend of the corresponding financial variables. However, these specifications do not control for any other shock(s) that might have

taken place in the two years following the recession that might have also affected these financial variables. To the extent that there were such shocks that would have affected our outcomes even otherwise, our estimates would be biased by these. As a result, we would not like to portray these estimates as causal effects, but as effects that are strongly suggestive of the effects of recession and stimulus on various school finance variables. However, we did some research to assess the presence of shocks (such as policy changes etc.) that might affect our outcome variables of interest independently of the recession and stimulus. To the best of our knowledge, we are not aware of any such common shocks during this period.

## **5 Results**

### **5.1 Overall Results**

Figure 2 shows the overall trends in our variables of interest. Looking at trends in total expenditure and total revenue per pupil, we see that while in general both continued to be on trend through the recession, in the last two years there has been a leveling off in funding per pupil and a perceptible decline in expenditure per pupil. Because the pre-recession trend was a steady increase, even the leveling off is a negative deviation from the trend.

As we look at the three main funding sources—federal aid, state aid, and local revenue—we see some interesting patterns. The stimulus is clearly visible in these graphs, as average per-pupil federal aid per pupil doubled in 2010. Federal aid decreased in 2011 and 2012, although we see that it is still above its pre-recession level. State aid peaked in 2009 and has been declining since then. Local funding leveled off during the initial recession year (2009), but has picked up in more recent years. A likely driver of this increase is an uptick in property tax revenue, seen in the adjacent graph. The bottom row of graphs shows the changes in the composition of funding.

There is a massive increase in the federal share in funding consistent with the spike in federal aid during the stimulus in 2010, and we can see that even though the share declines after 2010, it remains above the pre-recession trend. The state aid proportion peaked in 2009, the year before the stimulus kicked in, and declined sharply in 2010 as the stimulus kicked, and further decreased in 2011 or 2012. The share of local funding increased steeply after 2010 as federal and state funding fell.

Figure 3 examines some of the key components of expenditure. Instructional expenditure and instructional support remained roughly on trend until 2010 but declined sharply in 2011 and 2012, especially in the latter year. Transportation and utilities spending were hit in the immediate post-recession years, but the cuts were most severe in 2012. Student activities and pupil services spending also show adverse impacts in the post-recession period, but these impacts are by far the most prominent in 2011 and 2012.

Below, we analyze whether these patterns survive in a more formal trend shift analysis.

In Tables 2 and 3, the top part of each panel shows the percent shifts, while the lower part presents the regression coefficients that were used to derive the percent shifts. For ease of comparison, we also provide bar graphs of the percent shifts.

Table 2 and Figure 4 present results from estimation of specification (1). They reveal that in the first three years after the recession, school districts did not experience any statistically significant trend shift in total funding or expenditure per pupil. However, there is statistically significant evidence of negative shifts in both funding and expenditure in 2012.

Looking at the components of funding, we see that there was a large positive shift (over 125%) in federal aid per pupil in 2010 and that federal aid continued to be significantly above trend in 2011 and 2012. This is likely due to the influx of stimulus funds from ARRA, the bulk of which was disbursed in 2010 and 2011 with a small amount in 2012. Figure 5 shows how the role of federal funding varies across all districts in the state and over time. The maps show how the stimulus had a large effect across the whole state. Comparing the 2010 map to 2008 one can see the steep build-up of federal funding that accompanied the stimulus. An almost equally drastic cutback is seen in 2012, as the federal stimulus receded.

However, of note here is that federal aid makes up a relatively small percentage of school funding (as the table shows, the average in 2008 was 3.1%). Looking at state and local funding, we see statistically significant declines in 2010 through 2012. What is interesting is that in 2012, even as local funding fell significantly, its share of districts' total funding increased, indicating a compositional shift in how school districts are funded caused by the state's continued downward shifts in aid.

Table 3 and Figure 6 present the impacts on various components of spending. There is no evidence of any statistically significant decline in instructional expenditures through 2012. However, the story for instructional expenditure in 2012 is very different. A statistically and economically significant decline in instructional expenditure per pupil (relative to the trend) in 2012 is clearly evident from Table 3 and Figure 6. Instructional support shows large (statistically significant) declines in both 2011 and 2012.



Of note is that while instructional and instructional support expenditures were cut only in the last two years, most non-instructional expenditures evidenced cuts even earlier—transportation and utilities experienced sharp declines starting in 2010 and 2009, respectively. A possible interpretation of this is that when the recession hit, districts began cutting the spending categories that have less of a direct impact on student learning. But once the stimulus funding started drying up and state funding experienced even sharper cuts, school districts were forced to resort to cuts in instructional expenditures as well. Also of importance here is that a part of instructional expenditure (specifically, teacher salary) is relatively inelastic. The districts have less immediate flexibility as far as teacher contracts are concerned. Although the districts are unable to lay off most existing teachers, they are able to slow down hiring, institute pay freezes, or renegotiate contracts. These strategies would cut down on instructional expenditure, but not immediately.

## **5.2 How were Different Metropolitan Areas Affected?**

In this section we examine heterogeneities by metropolitan area. The patterns for each metro area are obtained by aggregating the patterns of its component districts. Here we present separate tables for the percent shifts and the regression coefficients—Tables 4-5 present the percent shifts while Tables A1-A2 present the corresponding coefficient estimates. Figures 7-8 show the results for the metro areas that we focus on. Most metro areas did not see a statistically significant fall in total funding (relative to trend) in 2009 or 2010 (NYC and Nassau are the exceptions) but most saw a decline in the two later years.

While there were variations across metro areas in total expenditures, in general total spending was more immune to cuts. Only Nassau had a statistically significant drop (relative to trend). NYC also showed a decline, but it was not statistically different from zero.

The pattern of federal aid is the same for all the metro areas, with a large and statistically significant shift (relative to trend) in 2010 when the federal stimulus took effect, and smaller shifts in 2011 and 2012. Notably, state aid has shifted down for every metro area since 2010. However, Nassau sustained the largest declines in all years, while Syracuse sustained the least. Local funding fell for all MSAs in all four years that we examine, and most of these declines are statistically significant. The share of federal funding more than doubled in all metro areas with the inception of federal stimulus. While the share declined in the latter years, it still remained above trend. The increases in Buffalo was the most prominent, and NYC the least. While the share of state funding declined in the later three years in all metro areas with the most prominent decline in 2012 in all metro areas, there were interesting variations. Local funding, however, saw a significant positive shift in the share even as the dollar amount shifted significantly down for almost all the MSAs. This is because local funding declined the least, relative to state and federal funding, so its share rose. NYC and Nassau's local funding shares were less affected by the recession.

Looking at the components of expenditure (Table 5 and Figure 8), we see some differences in how districts in the various MSAs allocated their funds. Instructional expenditure is generally considered to be the most directly related to student learning, and we see that districts maintained or increased their instructional spending in the first two years. However, almost all subsequently

experienced a sharp drop in 2011 and 2012. Buffalo and Syracuse had the smallest shifts in 2012, and both were statistically significant.

Non-instructional categories were affected differently across the MSAs, but there were some commonalities. Utilities and transportation both experienced the most consistent cuts over time and across MSAs. In some cases, districts increased their spending without a subsequent decrease, such as Rochester's increase in instructional support or Nassau's increase in pupil services, but such cases are exceptions to the overall trend of cuts.

Overall, Nassau experienced the largest reductions, followed by NYC. Buffalo experienced the smallest declines in funding, and as a result was able to maintain instructional expenditure. We see that 2012 was the hardest year for most districts with the ebbing of federal stimulus funds. Although most districts were able to avoid cuts in the earlier years to instruction, which is often considered to be the most crucial to student learning, all districts experienced sharp cuts to instructional expenditure in 2012, with most of the shifts being significant.

## **6 Conclusion**

This paper investigates school finance patterns in New York during the post-Great Recession era. This includes the recession period, and the years characterized by the injection of the federal stimulus and the subsequent withdrawal of the stimulus. We find that school funding and expenditure were not immediately affected by the recession but that in the most recent year of data there are significant cuts to both funding and expenditure. This is in line with the drawdown of the stimulus aid and the relative lack of improvement in the economy. These results indicate

that the full impact of the Great Recession is still being felt and that, for some, the worst might not be over yet. Looking at the composition of district expenditures, we see that districts preserved their instructional spending in the initial years following the Great Recession by cutting non-instructional expenditures, but that in 2012 as the stimulus waned districts were forced to cut their instructional spending. In contrast, many non-instructional expenditures were cut immediately after the recession, even during the stimulus, and continue to be below trend through 2012.

By conducting separate analyses for individual MSAs, we are able to see some interesting variations across the state. New York City and Nassau experienced the largest reductions in funding. Syracuse and Buffalo were able to preserve instructional expenditure. We see that in cutting non-instructional expenditures different MSAs chose different categories to cut—for instance, Rochester had large negative shifts in pupil services while maintaining or increasing instructional support while Nassau did the opposite by increasing or maintaining pupil services and cutting instructional support. The stimulus was meant to ameliorate such tough decisions. While the stimulus seems to have helped (especially in maintaining instructional expenditure), it was only temporary and ended before the state and local economies were fully recovered, leaving districts with tight budget restrictions. What we see everywhere is districts and cities facing tough choices about how to cope with the reality of a slow recovery. The goal of this paper is to shed light on the dynamics of school district finances during crises and examine the role that government policies can play. The federal stimulus appears to have been effective in preventing cuts during the years it was in place. Similar fiscal intervention might be useful in future economic downturns for softening the blow of fiscal crises on school districts. As for the

current crisis, we expect that as the economy slowly improves and state and local revenues increase, school district funding will also improve, but it is not clear when this will happen, nor do we know what effect the multi-year cuts in expenditure would have on student learning and development.

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Table 1: Components of Expenditure

<u><b>Instruction</b></u>	
<b>Instructional Expenditures</b>	All expenditure associated with direct classroom instruction. Teacher Salaries and benefits; classroom supplies; instructional training.
<u><b>Non-Instruction</b></u>	
<b>Instructional Support</b>	All support service expenditures designed to assess and improve students' well-being. Food services, educational television, library, and computer costs.
<b>Student Services</b>	Psychological, social work, guidance, and health services.
<b>Utilities and Maintenance</b>	Heating, lighting, water, and sewage; operation and maintenance.
<b>Transportation</b>	Total expenditure on student transportation services.
<b>Student Activities</b>	Extra-curricular activities: physical education, publications, clubs, and band.

**Table 2: Examining Patterns in Funding and Expenditures After the Recession**

	Total Funding Per Pupil (1)	Total Expenditure Per Pupil (2)	Federal Aid Per Pupil (3)	State Aid Per Pupil (4)	Property Tax Revenue Per Pupil (5)	Local Funding Per Pupil (6)	% Federal Aid (7)	% State Aid (8)	% Local Funding (9)
% Shift 2008-09	-0.59	-0.34	5.48	3.34***	-2.24	-4.79***	-2.27	2.67***	-3.51***
% Shift 2009-10	-1.86	2.32	126.21***	-6.28***	-1.68	-5.86***	126.24***	-5.50***	-3.14***
% Shift 2010-11	-5.79***	-1.45	89.13***	-13.76***	-0.90	-6.01**	95.35***	-7.54***	0.10
% Shift 2011-12	-8.97***	-6.84**	47.74***	-19.79***	-0.51	-5.90*	60.63***	-9.22***	2.84***
Pre-Recession Base	23833.79	24732.84	739.59	8267.70	10668.79	14594.96	3.09	39.83	56.00
Trend	990.38*** (107.62)	892.13*** (157.00)	-7.48 (10.74)	431.15*** (17.83)	360.50*** (88.16)	569.94*** (103.03)	-0.23*** (0.02)	0.40*** (0.04)	-0.09** (0.05)
2009	-141.40 (317.50)	-83.44 (415.50)	40.52 (54.82)	276.27*** (49.60)	-239.48 (163.09)	-698.55*** (256.59)	-0.07 (0.05)	1.06*** (0.10)	-1.96*** (0.11)
2010	-443.36 (361.77)	573.56 (586.75)	933.44*** (72.43)	-519.60*** (59.41)	-179.33 (266.31)	-854.97*** (326.88)	3.90*** (0.10)	-2.19*** (0.14)	-1.76*** (0.14)
2011	-1379.60*** (473.36)	-358.21 (674.69)	659.22*** (87.91)	-1137.96*** (69.84)	-95.64 (380.45)	-876.89** (441.01)	2.95*** (0.12)	-3.00*** (0.19)	0.05 (0.19)
2012	-2138.18*** (549.20)	-1691.47** (831.90)	353.08*** (70.24)	-1636.33*** (81.87)	-54.82 (468.20)	-861.54* (515.45)	1.88*** (0.13)	-3.67*** (0.22)	1.59*** (0.23)
Observations	5532	5532	5532	5532	5532	5532	5532	5532	5532
R-squared	0.87	0.84	0.86	0.96	0.91	0.90	0.88	0.99	0.99

Notes: \*, \*\*, \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively. Robust standard errors adjusted for clustering by school district are in parentheses. All regressions control for racial composition and percent of students eligible for free or reduced price lunch.



**Table 3: Examining Patterns in Expenditure Components After the Recession**

	Instructional Expenditure Per Pupil (1)	Instructional Support Per Pupil (2)	Student Services Per Pupil (3)	Transportation Per Pupil (4)	Student Activities Per Pupil (5)	Utilities & Maintenance Per Pupil (6)
% Shift 2008-09	-0.16	-0.07	-0.59	-4.03	0.20	-3.61*
% Shift 2009-10	1.49	-0.63	0.70	-8.34**	-1.52	-4.55*
% Shift 2010-11	-2.06	-4.64*	-1.98	-11.05**	-6.69***	-4.98*
% Shift 2011-12	-7.16***	-9.65***	-5.05	-16.14***	-13.86***	-11.43***
Pre-Recession Base	11604.25	929.79	683.47	1256.43	277.16	5970.06
Trend	307.52*** (54.12)	28.02*** (3.66)	19.83*** (5.44)	65.65*** (18.28)	9.99*** (0.79)	235.61*** (53.36)
2009	-18.57 (137.69)	-0.67 (8.42)	-4.06 (10.97)	-50.58 (54.20)	0.54 (1.86)	-215.41* (114.49)
2010	173.44 (189.40)	-5.83 (17.01)	4.76 (13.59)	-104.81** (51.17)	-4.20 (2.78)	-271.38* (153.36)
2011	-239.14 (198.12)	-43.15* (22.40)	-13.54 (14.40)	-138.86** (61.91)	-18.53*** (3.82)	-297.39* (166.04)
2012	-830.38*** (229.15)	-89.75*** (22.29)	-34.52 (26.09)	-202.79*** (73.70)	-38.43*** (4.57)	-682.61*** (227.00)
Observations	5532	5532	5532	5532	5532	5532
R-squared	0.91	0.85	0.88	0.81	0.94	0.93

Notes: \*, \*\*, \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively. Robust standard errors adjusted for clustering by school district are in parentheses. All regressions control for racial composition and percent of students eligible for free or reduced price lunch.

**Table 4: Examining Heterogeneities in Funding and Expenditure by Metropolitan Area**

Panel A	Total Funding Per Pupil					Total Expenditure Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	1.24*	-3.58*	-2.17**	1.18*	1.24	5.53*	-3.02	-2.82	4.91**	3.56
% Shift 2009-10	1.21	-7.29***	-2.74*	1.38	2.00	5.14	-4.73	-0.01	6.71**	11.24**
% Shift 2010-11	-4.65***	-11.10***	-6.58***	-3.72***	-3.46**	-0.46	-7.47**	-1.50	1.06	8.15
% Shift 2011-12	-7.32***	-13.00***	-11.76***	-8.47***	-7.15***	-3.34	-8.98***	-7.06	-1.64	-0.34
Pre-Recession Base	17682.41	29386.12	26916.80	19033.94	18806.60	18049.55	29688.85	28005.98	19340.24	19502.24
R-squared	0.95	0.95	0.96	0.91	0.92	0.72	0.94	0.87	0.62	0.70
Panel B	Federal Aid Per Pupil					State Aid Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	5.66	-4.49	-7.20	-3.14	-16.57*	3.47***	0.47	5.36***	4.54***	4.40***
% Shift 2009-10	176.73***	136.09***	103.72***	147.60***	121.54***	-3.76*	-17.66***	-7.55**	-4.01***	-2.59
% Shift 2010-11	139.66***	88.25***	75.41***	96.70***	84.78***	-14.89***	-26.96***	-15.82***	-10.72***	-9.38***
% Shift 2011-12	89.22***	22.95**	18.78	58.72***	28.67	-19.98***	-33.67***	-24.10***	-17.93***	-13.49***
Pre-Recession Base	525.76	457.74	516.37	641.71	687.27	8237.17	5169.66	3781.35	9299.74	9873.53
R-squared	0.92	0.77	0.84	0.92	0.82	0.97	0.95	0.97	0.97	0.97
Panel C	Property Tax Revenue Per Pupil					Local Funding Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	1.33	-2.72	-1.74**	-1.00	0.44	-3.78***	-5.33**	-4.24***	-4.42***	-3.63***
% Shift 2009-10	5.73	-4.69	-1.27	-0.43	2.60	-4.33***	-7.87**	-4.35***	-3.60***	-2.72
% Shift 2010-11	10.78	-6.92*	-4.42**	0.18	3.38*	-3.04*	-9.61**	-6.84***	-3.70***	-3.74
% Shift 2011-12	17.38	-6.93*	-7.81***	-0.85	4.04	-0.87	-9.31**	-10.41***	-3.88**	-3.12
Pre-Recession Base	5317.75	20183.28	18063.93	6128.23	5324.93	8677.17	23639.10	22495.46	8861.07	7983.63
R-squared	0.78	0.97	0.97	0.98	0.97	0.97	0.96	0.97	0.98	0.97
Panel D	% Federal Aid					% State Aid				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	4.30	1.05	-1.45	-1.79	-14.40*	2.08***	2.77***	7.68***	2.99***	2.48***
% Shift 2009-10	174.70***	152.19***	115.08***	145.77***	120.48***	-4.84***	-11.95***	-4.52*	-5.39***	-4.82***
% Shift 2010-11	145.37***	105.52***	92.94***	104.56***	92.77***	-9.90***	-16.27***	-8.62***	-7.30***	-6.73***
% Shift 2011-12	99.53***	44.78***	44.17*	75.29***	43.60**	-11.75***	-19.60***	-10.74***	-9.41***	-7.15***
Pre-Recession Base	2.88	1.68	1.87	3.29	3.56	45.77	20.54	14.50	48.51	52.09
R-squared	0.89	0.80	0.87	0.89	0.77	0.98	0.98	0.98	0.99	0.99
Panel E	% Local Funding									
	Buffalo	Nassau	NYC	Rochester	Syracuse					
% Shift 2008-09	-4.57***	-1.72***	-2.22***	-5.22***	-4.14***					
% Shift 2009-10	-5.31***	-0.21	-1.81***	-4.72***	-4.30***					
% Shift 2010-11	1.28	1.97***	-0.57	0.10	0.34					
% Shift 2011-12	5.27***	4.06***	0.80	3.90***	4.24**					
Pre-Recession Base	50.01	77.31	83.16	47.00	42.98					
R-squared	0.99	0.99	0.99	0.99	0.99					
Observations	336	929	449	464	343					

Notes: \*, \*\*, \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively. All regressions control for racial composition and percent of students eligible for free or reduced price lunch.

**Table 5: Examining Heterogeneities in Expenditure Components by Metropolitan Area**

	Instructional Expenditure Per Pupil					Instructional Support Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	2.08	-1.66	0.16	1.68	0.85	-0.31	-5.15	0.62	3.45	-0.31
% Shift 2009-10	4.33***	-3.36	2.85*	3.63***	4.50*	-1.60	-9.26**	0.45	8.24*	-0.79
% Shift 2010-11	3.24	-7.50*	-0.26	-0.27	0.26	-8.41**	-14.13**	-8.53**	3.02	-0.56
% Shift 2011-12	-1.60	-9.26***	-5.05**	-7.63***	-4.55	-10.00**	-19.22***	-11.89**	1.46	-0.73
Pre-Recession Base	8510.27	15364.07	13374.20	8847.00	8578.78	782.41	1013.94	969.34	910.54	873.67
Observations	336	929	449	464	343	336	929	449	464	343
R-squared	0.88	0.95	0.96	0.84	0.86	0.82	0.90	0.88	0.78	0.90
	Pupil Services Per Pupil					Transportation Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	1.39	4.08**	-0.57	-1.56	0.88	-4.71**	-5.04**	-0.49	-2.23	-1.71
% Shift 2009-10	3.62	4.40**	-1.58	-4.26	2.39	-7.04**	-10.52***	-3.33*	-2.65	-4.38*
% Shift 2010-11	4.95	3.12	-6.21**	-6.65	3.04	-4.69	-14.99***	-4.92*	-5.30*	-6.41*
% Shift 2011-12	1.94	-0.86	-10.07***	-10.51**	0.66	-10.43**	-22.64***	-11.71***	-11.37***	-13.47**
Pre-Recession Base	472.32	843.41	891.22	502.28	434.54	1004.32	1546.17	1321.54	1006.74	1045.86
Observations	336	929	449	464	343	336	929	449	464	343
R-squared	0.90	0.93	0.92	0.84	0.71	0.86	0.97	0.97	0.74	0.79
	Student Activities Per Pupil					Utilities Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
% Shift 2008-09	-0.03	1.54	-1.84	-0.12	3.91**	-0.56	-4.37	-4.50*	-0.68	-1.83
% Shift 2009-10	-1.24	0.32	-5.58**	0.17	0.18	0.03	-8.20*	-4.19	1.16	-2.21
% Shift 2010-11	-4.25*	-5.80	-11.65***	-4.62	-4.85	-2.51	-10.90**	-8.33	-3.76	-2.73
% Shift 2011-12	-15.16***	-11.34**	-13.34***	-14.96***	-15.68***	-8.02*	-15.95***	-12.28**	-10.28***	-9.73**
Pre-Recession Base	206.65	345.02	356.60	269.10	268.15	4127.96	7603.41	6266.24	4396.62	4046.05
Observations	336	929	449	464	343	336	929	449	464	343
R-squared	0.95	0.95	0.97	0.90	0.93	0.93	0.97	0.96	0.91	0.94

Notes: \*, \*\*, \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively. All regressions control for racial composition and percent of students eligible for free or reduced price lunch.

**Table A1: Examining Heterogeneities in Funding and Expenditure by Metropolitan Area**  
(Coefficients from Regressions Using Specification 1)

	Total Funding Per Pupil					Total Expenditure Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
2009	219.57*	-1052.19*	-584.68**	225.03*	232.73	997.85*	-895.19	-790.76	949.92**	694.97
	(124.76)	(590.68)	(224.57)	(127.59)	(195.16)	(561.89)	(560.57)	(536.37)	(363.68)	(417.18)
2010	213.92	-2143.37***	-738.27*	262.88	376.26	928.36	-1404.71	-2.69	1298.05**	2192.23**
	(161.54)	(806.76)	(388.48)	(174.26)	(280.73)	(603.89)	(868.69)	(1139.80)	(534.16)	(941.13)
2011	-821.93***	-3262.85***	-1771.37***	-708.28***	-650.40**	-82.89	-2217.46**	-419.10	204.71	1589.09
	(188.27)	(951.00)	(474.77)	(237.66)	(313.60)	(635.24)	(1079.09)	(1324.15)	(629.37)	(977.22)
2012	-1293.48***	-3819.27***	-3165.98***	-1612.93***	-1345.07***	-603.49	-2666.33***	-1978.39	-316.23	-65.77
	(239.31)	(909.06)	(474.73)	(310.79)	(378.98)	(749.37)	(991.98)	(1328.57)	(873.88)	(1029.98)
	Federal Aid Per Pupil					State Aid Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
2009	29.74	-20.56	-37.18	-20.16	-113.88*	286.15***	24.29	202.67***	422.16***	434.77***
	(18.85)	(31.34)	(65.09)	(25.63)	(61.18)	(84.37)	(88.65)	(72.12)	(82.55)	(117.50)
2010	929.17***	622.94***	535.59***	947.17***	835.34***	-309.43*	-913.21***	-285.53**	-373.07***	-255.80
	(29.83)	(43.99)	(104.04)	(41.89)	(102.28)	(155.27)	(121.59)	(111.98)	(112.89)	(173.88)
2011	734.30***	403.96***	389.41***	620.54***	582.69***	-1226.27***	-1393.68***	-598.28***	-997.02***	-926.17***
	(53.48)	(48.34)	(119.14)	(58.41)	(120.92)	(171.38)	(172.13)	(155.36)	(152.06)	(204.52)
2012	469.10***	105.03**	96.99	376.80***	197.06	-1645.67***	-1740.42***	-911.19***	-1667.31***	-1331.88***
	(49.19)	(52.32)	(160.06)	(77.92)	(139.20)	(240.20)	(207.86)	(182.77)	(182.75)	(251.76)
	Property Tax Revenue Per Pupil					Local Funding Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
2009	70.67	-549.99	-314.34**	-61.16	23.54	-327.86***	-1259.01**	-954.42***	-391.49***	-289.75***
	(86.26)	(479.39)	(119.19)	(49.42)	(61.96)	(80.46)	(562.10)	(149.82)	(64.34)	(103.95)
2010	304.89	-945.78	-229.17	-26.26	138.34	-376.12***	-1861.52**	-978.32***	-319.00***	-217.46
	(248.03)	(659.70)	(255.97)	(68.09)	(89.78)	(101.72)	(777.60)	(299.22)	(95.20)	(183.06)
2011	573.00	-1396.27*	-798.19**	11.00	179.87*	-263.73*	-2271.00**	-1539.13***	-328.15***	-298.66
	(385.33)	(715.62)	(306.96)	(89.62)	(105.82)	(135.81)	(913.74)	(363.84)	(121.37)	(178.54)
2012	924.14	-1399.34*	-1411.56***	-52.15	214.95	-75.76	-2200.00**	-2340.88***	-343.90**	-248.97
	(618.98)	(813.50)	(274.21)	(122.58)	(188.40)	(183.32)	(841.40)	(338.75)	(160.59)	(233.83)
	% Federal Aid					% State Aid				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
2009	0.12	0.02	-0.03	-0.06	-0.51*	0.95***	0.57***	1.11***	1.45***	1.29***
	(0.10)	(0.08)	(0.18)	(0.12)	(0.28)	(0.33)	(0.20)	(0.23)	(0.24)	(0.37)
2010	5.04***	2.56***	2.16***	4.79***	4.28***	-2.22***	-2.45***	-0.66*	-2.62***	-2.51***
	(0.20)	(0.16)	(0.33)	(0.21)	(0.51)	(0.55)	(0.25)	(0.34)	(0.36)	(0.63)
2011	4.19***	1.77***	1.74***	3.44***	3.30***	-4.53***	-3.34***	-1.25***	-3.54***	-3.50***
	(0.27)	(0.16)	(0.38)	(0.30)	(0.59)	(0.68)	(0.36)	(0.42)	(0.47)	(0.73)
2012	2.87***	0.75***	0.83*	2.47***	1.55**	-5.38***	-4.03***	-1.56***	-4.56***	-3.73***
	(0.29)	(0.17)	(0.47)	(0.40)	(0.68)	(0.93)	(0.43)	(0.46)	(0.60)	(0.84)
	% Local Funding									
	Buffalo	Nassau	NYC	Rochester	Syracuse					
2009	-2.28***	-1.33***	-1.84***	-2.46***	-1.78***					
	(0.31)	(0.21)	(0.32)	(0.22)	(0.28)					
2010	-2.65***	-0.17	-1.51***	-2.22***	-1.85***					
	(0.49)	(0.26)	(0.45)	(0.33)	(0.41)					
2011	0.64	1.52***	-0.47	0.05	0.15					
	(0.60)	(0.35)	(0.51)	(0.41)	(0.52)					
2012	2.64***	3.14***	0.66	1.83***	1.82**					
	(0.82)	(0.44)	(0.67)	(0.48)	(0.69)					
Obs	336	929	449	464	343					

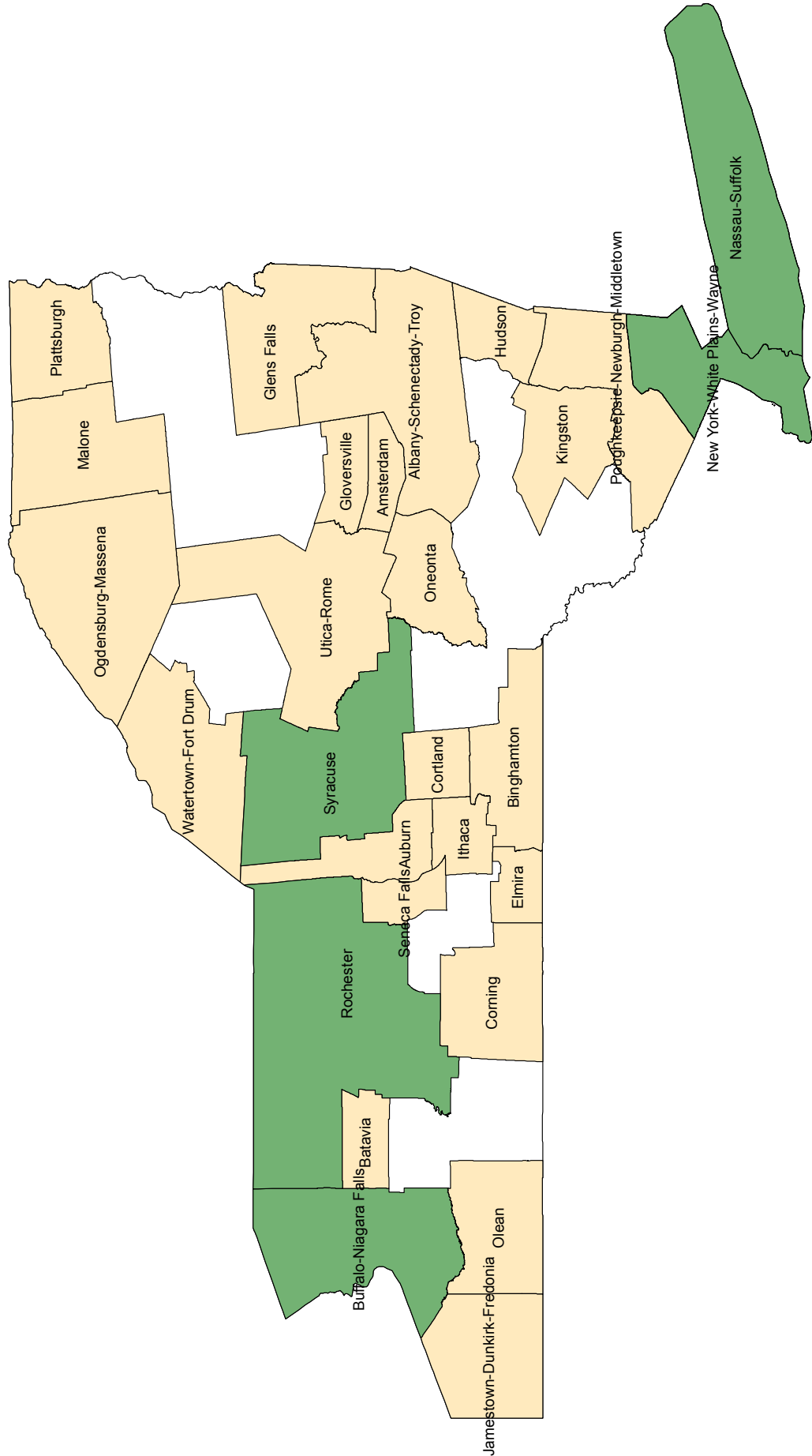
Notes: \*, \*\*, \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively. Robust standard errors adjusted for clustering by school district are in parentheses. All regressions control for racial composition and percent of students eligible for free or reduced price lunch.

**Table A2: Examining Heterogeneities in Expenditure Components by Metropolitan Area**  
(Coefficients from Regressions Using Specification 1)

	Instructional Expenditure Per Pupil					Instructional Support Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
Trend	118.66*** (28.15)	285.26* (147.49)	180.23*** (53.38)	148.30*** (33.12)	151.65** (58.43)	21.51*** (5.98)	38.44*** (10.70)	19.53** (9.63)	23.53* (12.75)	19.85*** (7.18)
2009	177.37 (122.52)	-255.32 (309.69)	21.42 (131.56)	148.50 (95.39)	72.91 (122.02)	-2.40 (20.22)	-52.24 (32.32)	6.06 (19.12)	31.37 (21.88)	-2.71 (22.90)
2010	368.81*** (116.67)	-516.08 (484.93)	381.42* (192.28)	321.38*** (100.05)	385.98* (215.69)	-12.49 (23.67)	-93.88** (45.07)	4.37 (30.38)	75.02* (40.39)	-6.94 (35.17)
2011	275.89 (203.19)	-1151.73* (631.29)	-34.27 (223.70)	-24.16 (133.46)	22.32 (249.23)	-65.79** (26.32)	-143.30** (56.74)	-82.69** (38.86)	27.51 (50.78)	-4.93 (51.93)
2012	-136.46 (187.54)	-1422.17*** (439.94)	-674.78** (282.80)	-675.05*** (187.05)	-390.05 (287.80)	-78.21** (34.39)	-194.84*** (65.98)	-115.26** (52.63)	13.32 (74.82)	-6.34 (54.24)
Observations	336	929	449	464	343	336	929	449	464	343
R-squared	0.88	0.95	0.96	0.84	0.86	0.82	0.90	0.88	0.78	0.90
	Pupil Services Per Pupil					Transportation Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
Trend	6.67** (3.00)	6.65 (6.85)	33.32*** (8.43)	16.07*** (4.20)	7.92 (5.09)	26.14*** (8.37)	58.95*** (16.02)	33.80*** (8.62)	37.02*** (5.83)	39.20*** (10.90)
2009	6.56 (6.91)	34.38** (16.69)	-5.11 (10.09)	-7.83 (10.70)	3.83 (12.86)	-47.32** (22.29)	-77.96** (36.63)	-6.52 (17.01)	-22.46 (24.65)	-17.84 (23.87)
2010	17.12 (10.96)	37.09** (17.33)	-14.04 (16.50)	-21.41 (28.15)	10.39 (23.30)	-70.66** (30.70)	-162.73*** (55.40)	-44.03* (24.95)	-26.69 (27.25)	-45.82* (23.20)
2011	23.38 (14.24)	26.29 (23.63)	-55.35** (21.77)	-33.38 (25.18)	13.22 (31.90)	-47.09 (42.44)	-231.84*** (65.91)	-65.06* (35.27)	-53.39* (27.23)	-67.06* (37.66)
2012	9.18 (17.77)	-7.24 (30.19)	-89.78*** (24.52)	-52.79** (25.43)	2.86 (33.45)	-104.72** (46.64)	-350.12*** (78.69)	-154.70*** (42.03)	-114.48*** (34.92)	-140.86** (54.98)
Observations	336	929	449	464	343	336	929	449	464	343
R-squared	0.90	0.93	0.92	0.84	0.71	0.86	0.97	0.97	0.74	0.79
	Student Activities Per Pupil					Utilities Per Pupil				
	Buffalo	Nassau	NYC	Rochester	Syracuse	Buffalo	Nassau	NYC	Rochester	Syracuse
Trend	7.57*** (1.32)	10.53*** (2.59)	11.27*** (2.91)	13.04*** (1.78)	9.72*** (1.81)	91.74** (36.43)	131.34 (132.51)	203.63*** (69.12)	145.71*** (20.03)	121.64*** (37.19)
2009	-0.06 (2.59)	5.31 (5.24)	-6.55 (5.87)	-0.32 (4.19)	10.48** (4.93)	-23.08 (59.09)	-332.55 (234.49)	-281.87* (152.52)	-29.98 (55.68)	-73.98 (71.37)
2010	-2.57 (3.50)	1.10 (8.93)	-19.90** (9.87)	0.46 (6.81)	0.49 (7.58)	1.43 (95.52)	-623.24* (333.50)	-262.70 (170.59)	51.21 (81.99)	-89.59 (107.10)
2011	-8.77* (5.01)	-20.02 (12.46)	-41.56*** (12.54)	-12.43 (8.67)	-13.01 (9.44)	-103.77 (132.73)	-828.74** (353.41)	-522.14 (342.59)	-165.41 (101.38)	-110.57 (127.27)
2012	-31.33*** (7.02)	-39.11** (16.39)	-47.56*** (15.09)	-40.26*** (10.35)	-42.06*** (12.13)	-331.20* (171.59)	-1212.60*** (394.14)	-769.24** (368.42)	-451.91*** (155.76)	-393.49** (172.98)
Observations	336	929	449	464	343	336	929	449	464	343
R-squared	0.95	0.95	0.97	0.90	0.93	0.93	0.97	0.96	0.91	0.94

Notes: \*, \*\*, \*\*\* denote statistical significance at the 10, 5, and 1% level, respectively. Robust standard errors adjusted for clustering by school district are in parentheses. All regressions control for racial composition and percent of students eligible for free or reduced price lunch.

Figure 1: Metropolitan & Micropolitan Areas of New York



This map shows all metropolitan and micropolitan areas of New York. Areas in green are the metropolitan areas that we examine in our heterogeneity analysis. NYC and Nassau are both part of the NYC metropolitan area, but are considered separate metropolitan divisions by the Census bureau. We analyze them as separate metro areas because of divergences in their school finance patterns.

Figure 2: Trends in School Funding and Expenditure

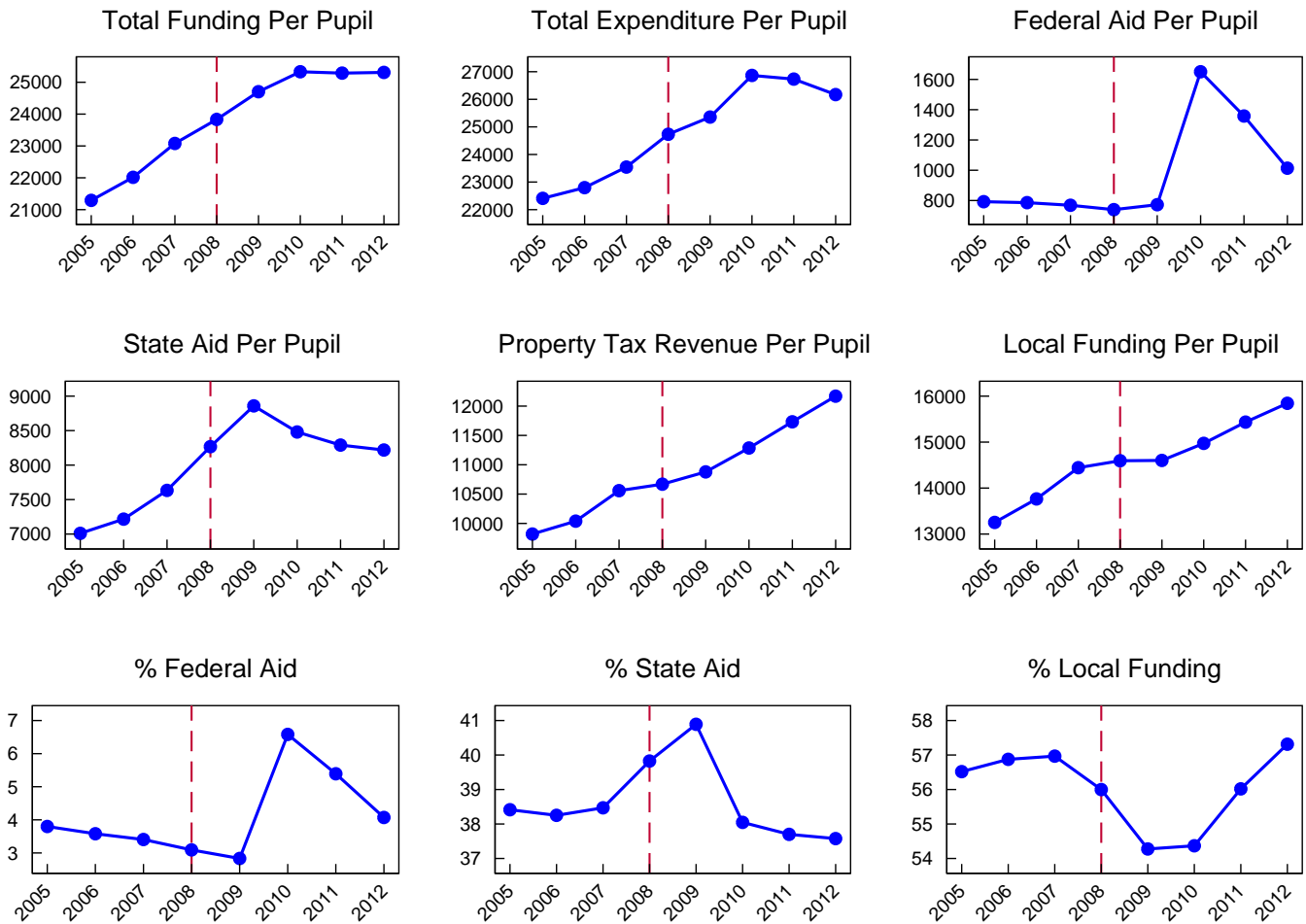
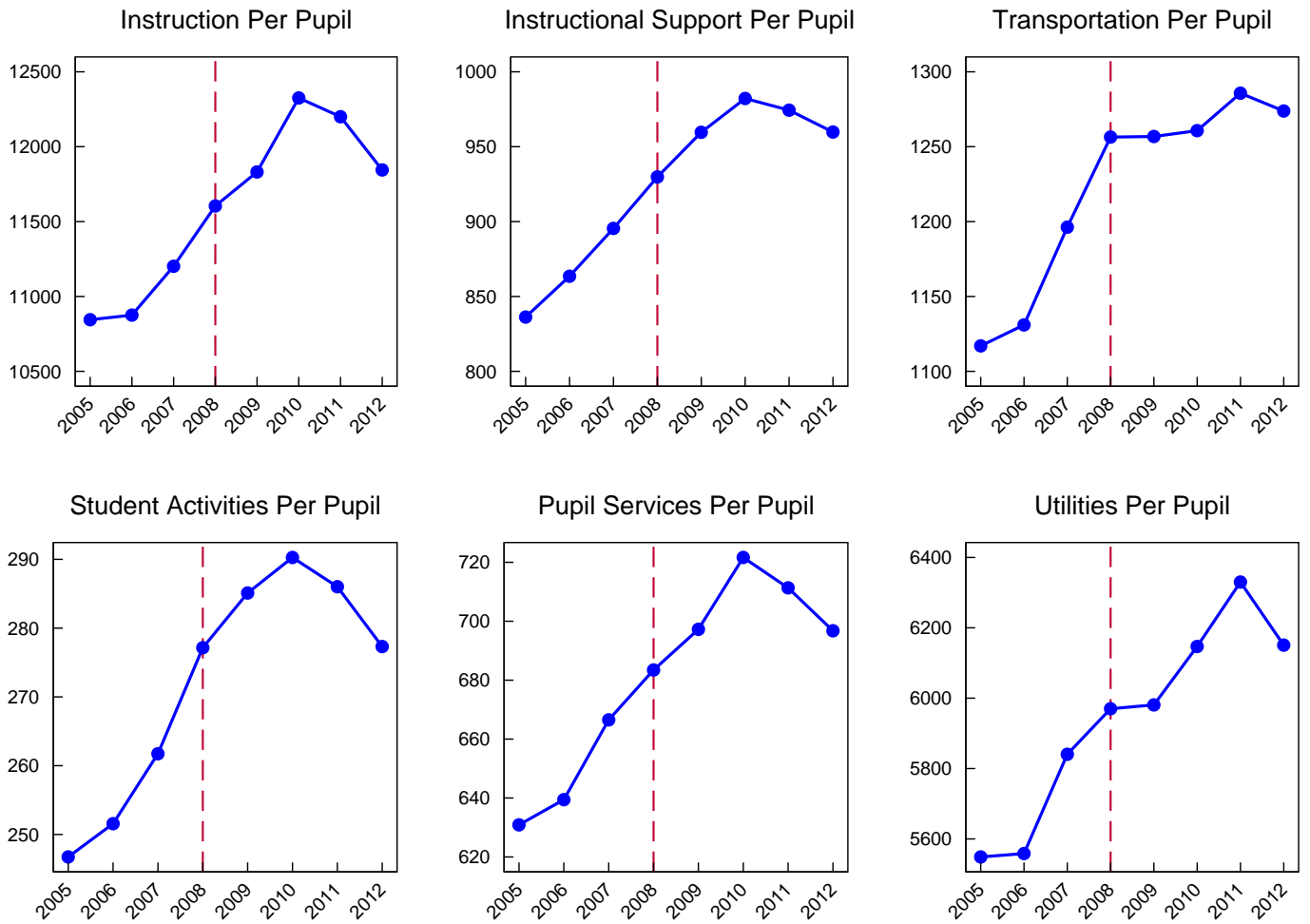
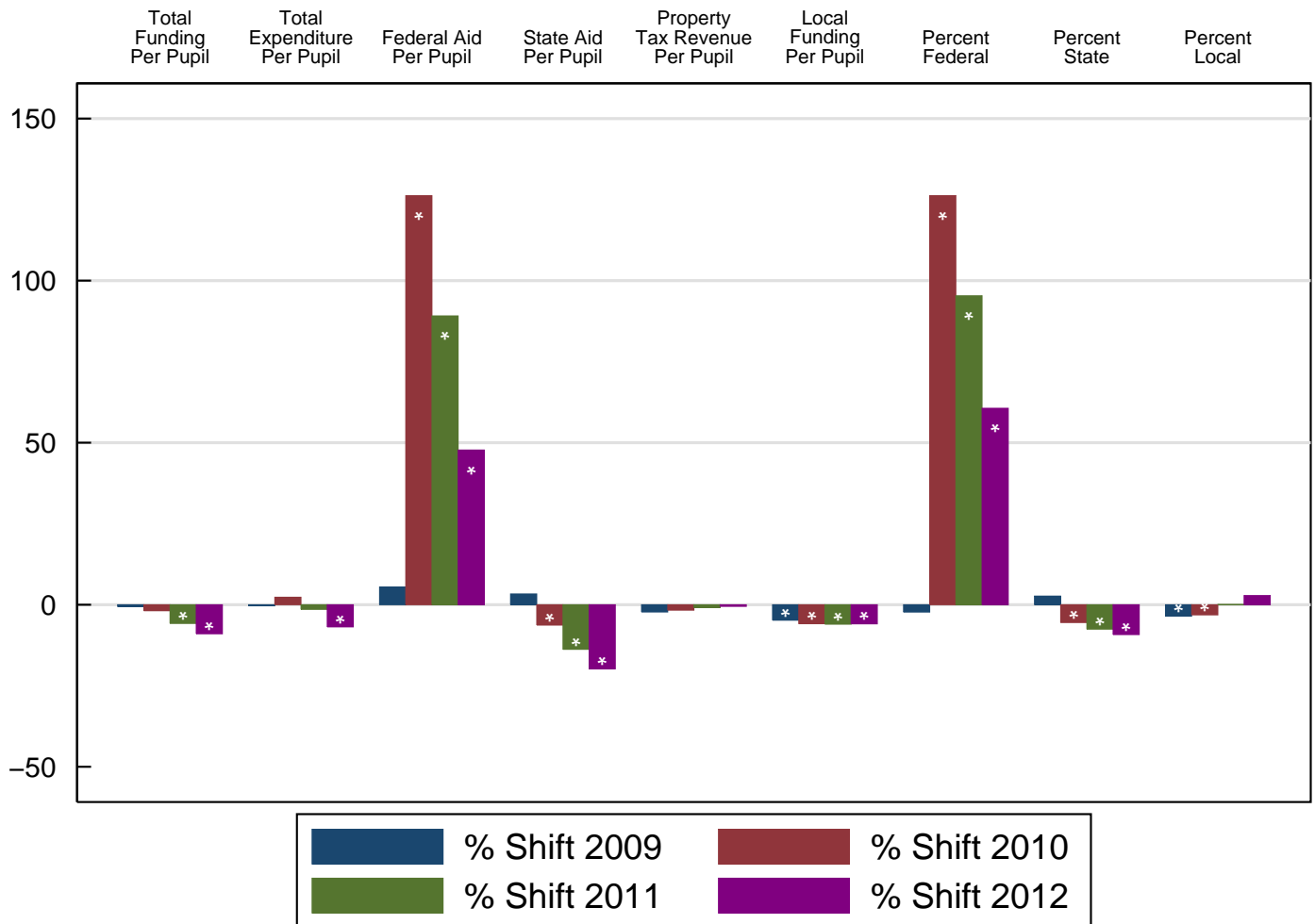


Figure 3: Trends in Expenditure Components



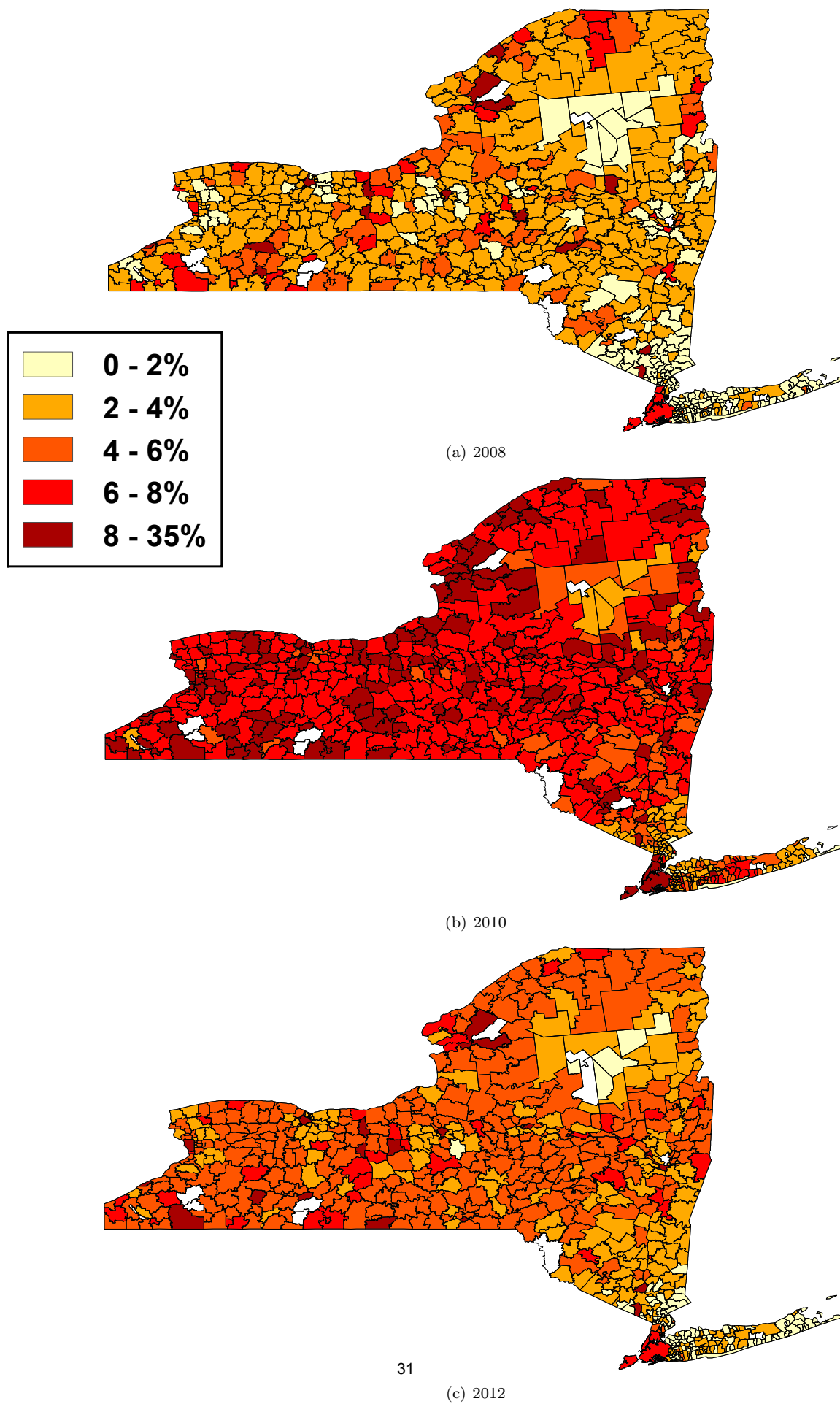


**Figure 4: Examining Patterns in Funding and Expenditures**  
(Using Shifts from the Pre-Recession Trend)

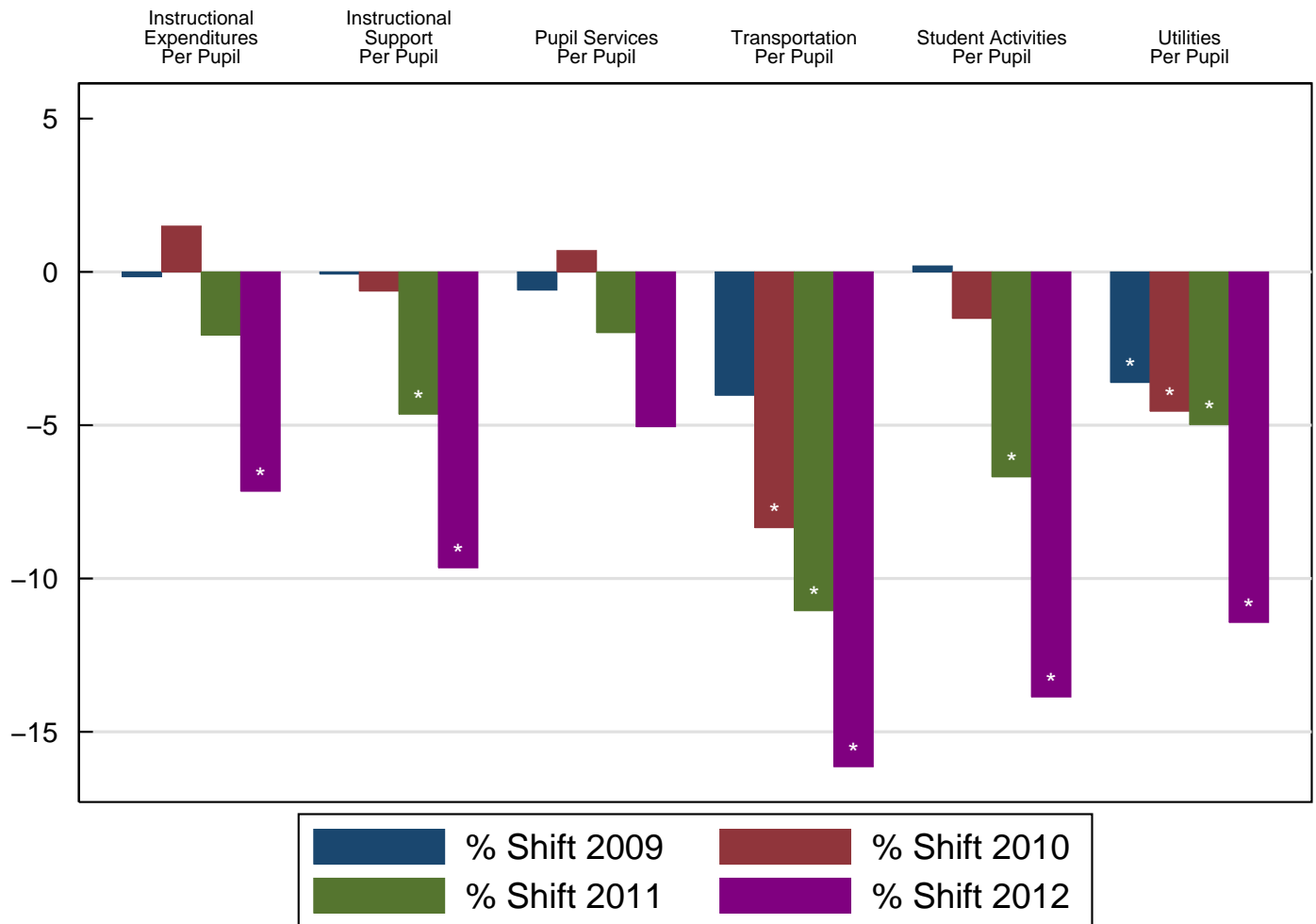


Note: Stars indicate statistical significance at the 10%, 5%, or 1% level.

Figure 5: Percent of District Funding from Federal Aid

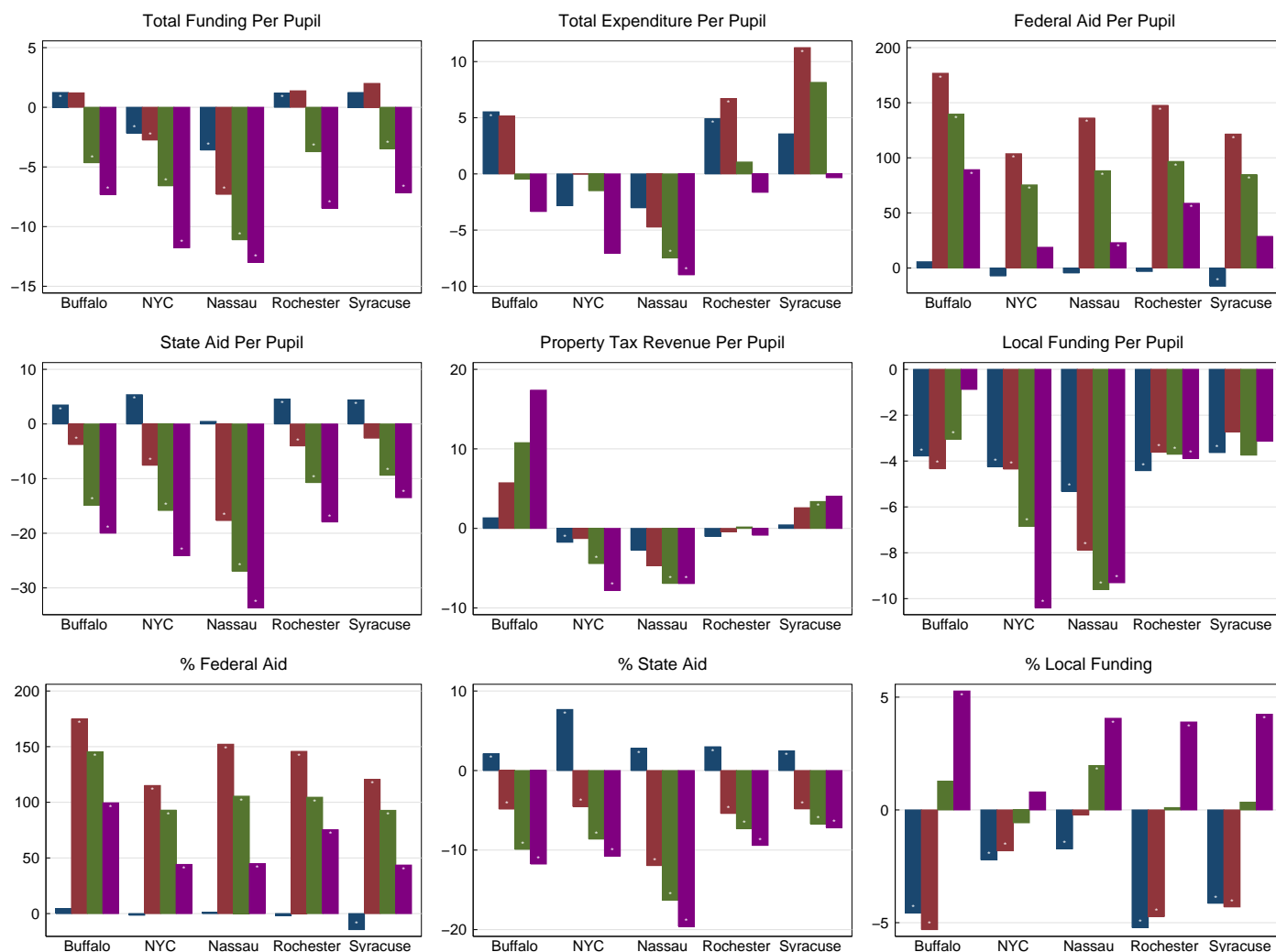


**Figure 6: Examining Patterns in Expenditure Components**  
(Using Shifts from the Pre-Recession Trend)



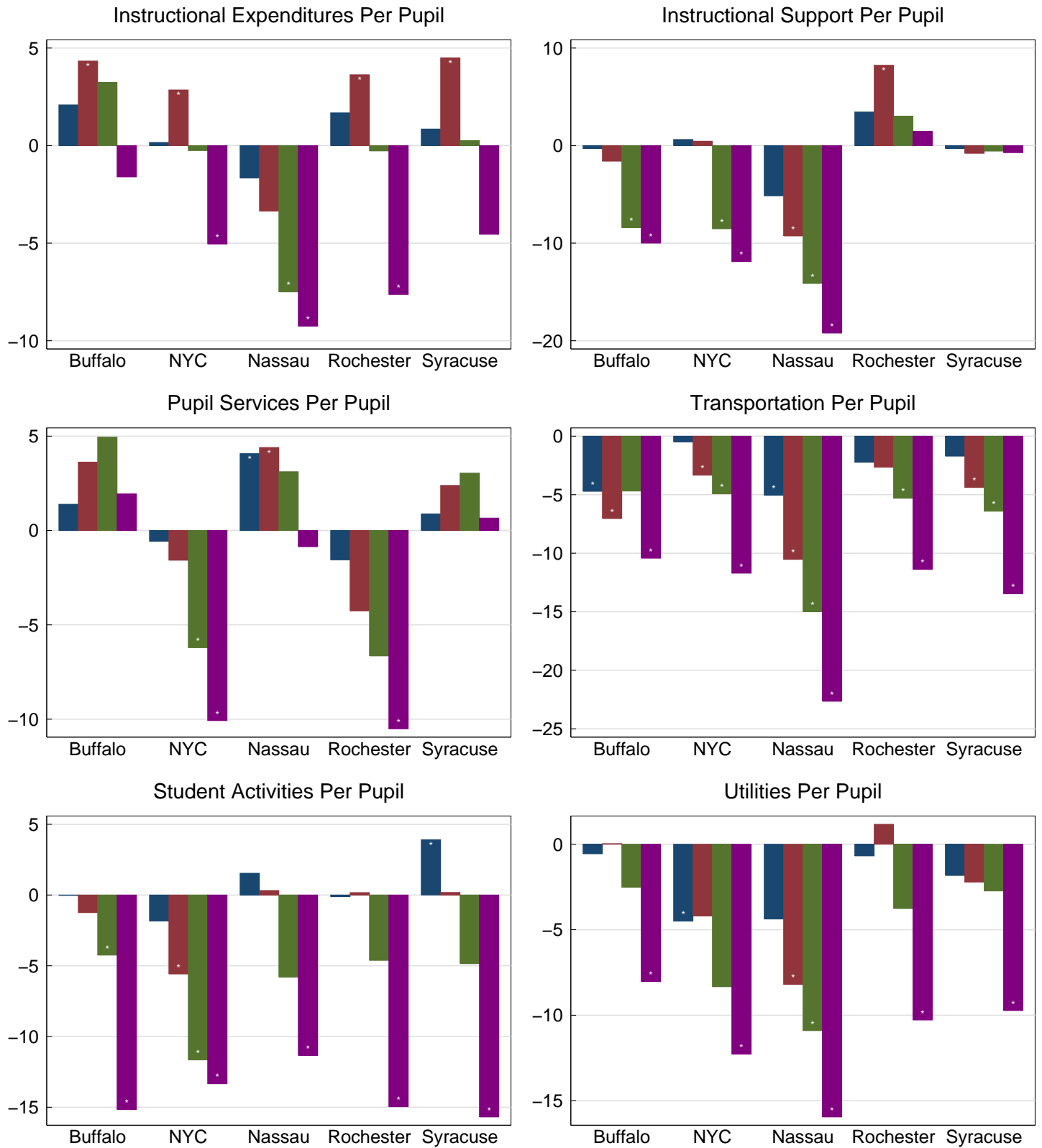
Note: Stars indicate statistical significance at the 10%, 5%, or 1% level.

**Figure 7: Examining Heterogeneities in Funding and Expenditure by Metropolitan Area  
(Using Shifts from the Pre-Recession Trend)**



Note: Stars indicate statistical significance at the 10%, 5%, or 1% level.

Figure 8: Examining Heterogeneities in Expenditure Components by Metropolitan Area  
(Using Shifts from the Pre-Recession Trend)



Note: Stars indicate statistical significance at the 10%, 5%, or 1% level.