

THE GREAT RECESSION'S IMPACT ON SCHOOL DISTRICT FINANCES IN NEW YORK STATE

- Researchers have explored the effects of the Great Recession on different parts of the economy, but little research exists on the impact of the Great Recession on schools.
- Property, income, and sales tax revenue were all hurt by the financial crisis and recession, and these declines limited the ability of state and local governments to fund school districts.
- An analysis of school financing in New York State from 2004 to 2010 finds that total funding and expenditures were maintained in line with pre-recession trends, but that the composition of each changed in significant ways.
- On the funding side, the federal stimulus offset cuts in local and, especially, state financing. On the expenditure side, instructional spending was maintained on trend while noninstructional spending—transportation, activities, utilities—suffered. Affluent districts saw larger drops than poorer districts, while the New York City metro area was hit harder than other areas of the state.

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1. INTRODUCTION

The financial crisis and the Great Recession that followed led to declining tax revenues, which, in turn, strained state and local government finances. Property, income, and sales tax revenue were all hurt by the bursting of the housing bubble and a weakened labor market, and these decreases in revenue limited state and local governments' ability to fund school districts. Starting in the fall of 2009, the federal government, through the American Recovery and Reinvestment Act (ARRA), allocated \$100 billion to states for education in an effort to lessen the impact of decreased state and local funding and stave off serious budget cuts. New York State received \$5.6 billion of the ARRA stimulus funding and an additional \$700 million from the Race to the Top Competition.¹

Because schools are an indispensable part of our economy and society and have an undisputed role in human capital formation and the shaping of the nation's future, it is

¹ Race to the Top is a competitive grant program created by the U.S. Department of Education that rewards states on the basis of reforms and innovation in K-12 education.

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essential to understand how the Great Recession affected schools and what, if any, repercussions the recession might have on school funding and spending and hence the delivery of educational services and student learning. While a slowly emerging literature seeks to understand how the Great Recession affected other parts of the economy, there is surprisingly little literature on how it affected schools (Chakrabarti and Sutherland 2013). This article starts to fill the gap. Here, we study the ways in which New York State's school funding and expenditures, as well as the composition of each, were affected by the recession and the federal stimulus. In addition to investigating aggregate trends, we analyze whether there were variations in these patterns across metropolitan areas, poverty levels, district sizes, and urban status (urban, suburban, or rural). New York is of interest primarily because it includes New York City, the country's largest school district. In addition, New York's is the third-largest state school system, serving 5.6 percent of the nation's students.² Also notable is the state's diversity: it contains a range of urban, suburban, and rural districts, with a wide distribution of income levels.

Some interesting findings emerge. There is no evidence of any statistically significant shift—relative to trend—in either total funding per pupil or total expenditure per pupil after the recession.³ But while we find no evidence of overall shifts, there is robust evidence of compositional shifts within both funding and expenditures. With the infusion of federal stimulus funds, state aid shifted downward (relative to trend), and so did local funding. Meaningful shifts are also observed in the composition of expenditures. Instructional expenditures, the key category that most directly affects student learning, remained on trend. In contrast, noninstructional categories such as student activities, student services, transportation, and utilities and maintenance (“utilities”) experienced cutbacks (relative to trend), although the effects were not always statistically significant. See Table 1 for descriptions of the various expenditure categories.

In addition to these overall patterns, we find considerable variations within the state. Affluent districts were the worst hit in terms of both funding and expenditure (relative

² This statistic is based on authors' calculations using the Common Core of Data of the National Center for Education Statistics for the 2008-09 school year.

³ While there is evidence of small declines in total funding per pupil (especially in the 2009-10 school year), these effects are never statistically different from zero.

TABLE 1
Definitions of Expenditure Components

Instruction	
Instructional expenditures	All expenditures associated with direct classroom instruction, including teacher salaries and benefits, classroom supplies, and instructional training
Noninstruction	
Instructional support	All support service expenditures designed to assess and improve students' well-being, including food services, educational television, library, and computer costs
Student services	Psychological, social work, guidance, and health services
Utilities and maintenance	Heating, lighting, water, and sewage; operation and maintenance
Transportation	Total expenditures on student transportation services
Student activities	Extracurricular activities, including physical education, publications, clubs, and band

to trend). Noninstructional expenditures fell the most in these districts, and unlike high- and medium-poverty districts, affluent districts exhibited a fall in instructional expenditures as well. Analysis by metro area reveals that Nassau County experienced sizable downward shifts both in total expenditure and in its various components. New York City also experienced some declines, though they were considerably smaller economically than those in Nassau County. There were heterogeneities by urban status as well. Urban districts exhibited the largest declines in both instructional and noninstructional expenditures, although these declines were not always statistically significant. (Note that all these changes are relative to trend of the corresponding variable.)

The patterns suggest that, in the face of budget cuts, school districts focused on maintaining instructional expenditures on trend. Across the board, noninstructional categories were affected much more adversely than instructional expenditures, while in most cases, instructional expenditures were maintained on trend. In the small number of cases where there were declines, they were economically and statistically small.

A caveat relating to our analysis is worth noting here. We use a trend shift analysis: we look for a shift in various school finance indicators from their

pre-existing trends to two subsequent time frames: the first school year after the start of the recession (2008–09) and the school year during which school districts received the infusion of federal stimulus funds (2009–10). We attribute any such shifts in the school year just after recession to the recession and any shift in the following year to a combination of recession and federal stimulus. Note, though, that if there were shocks during these two years that affected our school finance indicators independently of the recession, our estimates would be biased. So we look upon our estimates as strongly suggestive but not necessarily causal. Although this caveat should be kept in mind while interpreting the results of this article, we did an extensive search for such potentially confounding shocks and found none. Moreover, the Great Recession was not a marginal shock at all, but rather a highly discontinuous one. So even if there were small shocks during these two years, they would, by far, be overpowered by the enormous shock of the Great Recession.

2. OVERVIEW OF THE LITERATURE

This article is related to the literature that studies school district funding. Stiefel and Schwartz (2011), analyzing school finance patterns in New York City from 2002 to 2008, find evidence of large increases in per pupil funding during this period. Rubenstein et al. (2007), studying schools in New York City, Cleveland, and Columbus, Ohio, find that schools with higher poverty levels receive more funding per student. Baker (2009), studying schools in Texas and Ohio, finds that resources vary according to student needs within districts. But this article is most closely related to the literature that studies the impact of recessions on schools. Studying the 2001 recession and regressing the percentage change in property taxes per capita on the change in state aid per capita as a percentage of property taxes per capita, Dye and Reschovsky (2008) find that state funding cuts were partially offset by increased property tax funding. Studying funding and expenditure patterns for New Jersey following the Great Recession, Chakrabarti and Sutherland (2013) find that New Jersey districts faced declines in state funding (relative to trend). Interestingly, this decline prompted compositional shifts in expenditures in favor of categories linked most closely to instruction, while

expenditures in several noninstructional categories, including transportation and utilities, declined.

It follows from the above discussion that while there is research on school funding and resource allocation within and across districts, the literature on the impact of recessions, especially the Great Recession, on schools is woefully sparse. This article takes a step toward filling that gap by studying the impact on school finances in New York State. Understanding how school districts fared during the Great Recession promises to improve current understanding of schools' financial situations and response to financial stress, and will aid future policy decisions.

3. BACKGROUND

3.1 Financial Crisis and Federal Stimulus Funding

The burst of the housing bubble and the onset of the recession in 2007 strained the finances of state and local governments as their funding slowed. The housing market began cooling in 2005 and 2006 as foreclosures increased. In 2007, as subprime lenders declared bankruptcy and credit for home equity loans dried up, the housing market crashed. According to the CoreLogic Home Price Index, the United States as a whole saw a 29.4 percent drop in housing values from October 2006 to February 2009. The decline in New York State, at 13.5 percent, was less drastic. Local governments nationwide, which typically derive a large percentage of their total revenue from property taxes, faced falling revenues as a result of declines in the housing market.

State governments also saw a decline in funds, owing both to reduced income tax revenues from increased unemployment and reduced sales tax revenues from lower consumption. New York's unemployment rate increased from 4.6 percent in 2006 to 8.5 percent in 2010, though the state fared better than the nation, which had the same unemployment rate in 2006 and 9.6 percent unemployment in 2010.⁴ State tax revenue fell 8 percent in New York from 2007 to 2009, similar to the national state average, which declined 9 percent.

⁴ Authors' calculations based on the Current Population Survey and Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics. Accessed via Haver Analytics.

The financial downturn limited state and local governments' ability to fund school districts and resulted in difficult budget decisions. According to the Center on Budget and Policy Priorities, at least forty-six states and the District of Columbia worked to close budget shortfalls entering the 2011 fiscal year. K-12 education derives more than half of its funding from state revenue, so these budget gaps had significant implications for education financing. 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 starting in the 2009-10 school year and running through the fall of 2011.

The ARRA money lessened the impact of decreased state and local funding on school budgets. Approximately \$5.6 billion of the ARRA funds went to New York schools.⁵ Nationwide, districts were directed to use the ARRA funds to save and create jobs, to boost student achievement and bridge student achievement gaps, and to improve accountability and performance reporting. 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.⁶

3.2 Budget Cuts

When faced with tight budgets, school districts tend to trim spending that does not affect core subjects (Cavanagh 2011). Common cuts include extracurricular activities, art and music programs, maintenance, purchases, transportation, and equipment upgrades. After these initial cuts, more severe options are considered, such as increased class size, decreased staff, and reductions in instruction hours, benefits, professional development, and bonuses.

⁵ These estimates include State Fiscal Stabilization Funds; Title I Part A—Supporting Low-Income Schools; IDEA Grants, Parts 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>

⁶ Race to the Top (RTT) awards were announced in April 2010 and distributed starting in the 2010-11 school year, running to the fall of 2014, so these RTT funds were not available during the school years discussed in this article.

3.3 New York State School Funding Overview

Funding for public schools in the United States comes from three main sources: the federal government, the state government, and local funding. The last item, local funding, reflects locally raised revenue within a school district, mostly from property taxes. In the 2007-08 school year—which we take as the immediate pre-recession year because budgets were set in spring 2007, before the recession began—New York State districts received approximately 3 percent of their funding from federal aid, 40 percent from the state, and 57 percent from local funding. By 2009-10, reliance on federal aid increased to approximately 7 percent, and the share of funding from state and local sources fell to 38 percent and 55 percent, respectively. The bulk of federal school aid goes to Title I funding to support low-income students and students with disabilities.

State aid for education primarily comes from the State General Fund, which is financed by state income and sales taxes. Some additional funding comes from the Special Funding account supported by lottery receipts (State Department of Education 2009). State aid to school districts is based on a variety of characteristics of the school districts, including enrollment, regional labor market costs, the percentage of low-income students, and the percentage of students with limited proficiency in English.

In New York State, 90 percent of local funding comes from residential and commercial property tax receipts. The largest school districts—Buffalo, New York City, Rochester, Syracuse, and Yonkers—fund their schools from city budgets instead of linking funding directly to property tax revenue. New York City, which accounts for about half of the New York State student population, has undergone important finance policy changes in recent years. The Children First initiative, which started in 2003, increased teachers' salaries and boosted financial incentives to work in high-need schools and subject areas with teacher shortages (Goertz, Loeb, and Wyckoff 2011). In 2008, the Fair Student Funding program aimed to improve the distribution of resources by allocating school funds based on the number of low-income, special education, and low-achieving students, as well as the number of 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).

4. DATA

We use school district financial report data from the New York Office of the State Comptroller. The data cover the 2004-05 to 2009-10 school years and the 714 school districts in New York State. Student demographic data and the percentage of students eligible for free or reduced-price lunches from 2004-05 to 2009-10 are available from the New York State Department of Education.

The school finance data set includes funding, expenditure, and enrollment information, as well as individual components of funding and expenditure. Funding information includes data on total funding, on the amount of aid received from federal and state sources, and on local funding, including property tax funding. Expenditure information includes total expenditures, as well as detailed data on instructional expenditures, instructional support expenditures, student services, transportation, and utilities. The definition of each of these variables is provided in Table 1. The data set includes total fall student enrollment figures for each school year in the covered period.

We categorize districts as high-poverty, medium-poverty, or low-poverty, based on the percentage of students who received free or reduced-price lunch in the 2007-08 school year. Districts that fall within the top 75th percentile (that is, those in which 42 percent or more of students were receiving free or reduced-price lunch) are categorized as high-poverty districts. We categorize the bottom 25th percentile, or those districts with 13 percent or less of students in the lunch program, as low-poverty. The rest of the districts are referred to as medium-poverty.

We use the National Center for Education Statistics (NCES) Common Core of Data (CCD) designations of urban status in 2007-08 to categorize districts as urban, suburban, or rural. Districts inside urbanized areas or inside urban clusters less than thirty-five miles from urbanized areas are categorized as urban. Districts outside principal cities and towns but close to urbanized areas make up the suburban districts. The NCES categorizes areas that have fewer than 2,500 inhabitants and are outside of an urban area as rural.

We perform heterogeneity analysis by metropolitan area. We consider the following metro areas: Albany, Buffalo, Rochester, Syracuse, Ithaca, New York City, and Nassau-Suffolk. The first four are Metropolitan Statistical Areas (MSAs). Since Ithaca's MSA has only a

few school districts, we study the Binghamton, Cortland, Elmira, and Ithaca MSAs together and refer to them as the Ithaca Metropolitan Area. While New York City and Nassau-Suffolk constitute one MSA, because of their differences, we study them separately as the New York–White Plains Division and the Nassau County Metropolitan Division (“Nassau”).⁷ See Exhibit 1 for a map of the areas we examine.

As noted previously, we take the school year 2007-08 to be the immediate pre-recession year. School year budgets are finalized in the preceding spring, meaning that the budget for the 2007-08 school year was set in spring 2007, before the recession hit.

In the rest of the article, we refer to school years by the year of the spring semester.

5. INTERPRETATION OF POST-RECESSION EFFECTS

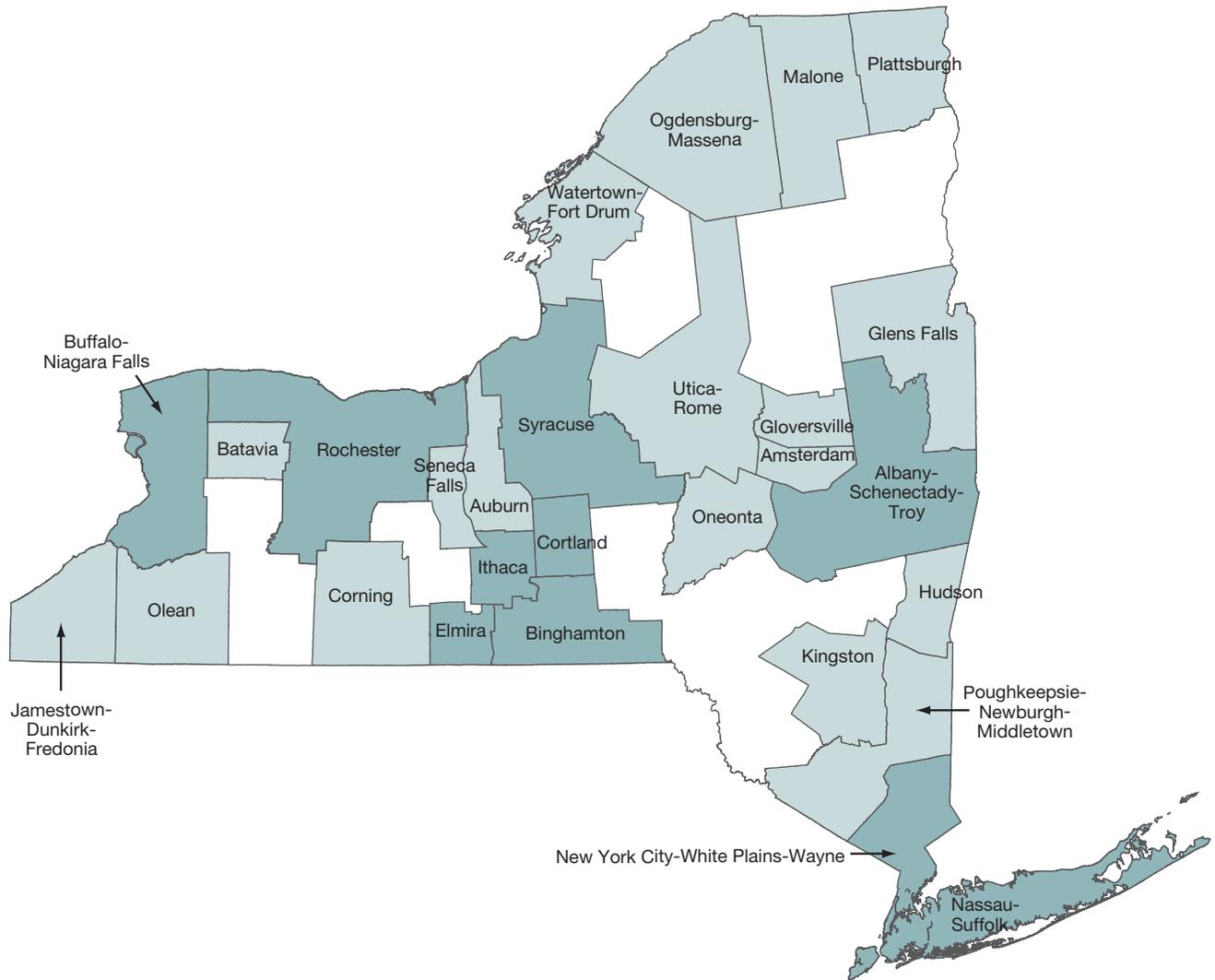
The goal of this article is to investigate whether the Great Recession and the federal stimulus funding period that followed were associated with shifts in education financing in New York State. We conduct a trend shift analysis and use the specification in the Box to analyze these effects. The reasoning behind this methodology is that we expect that school finances would have continued to grow at their pre-recession rate had there been no recession. Thus, post-recession effects (α_2 and $[\alpha_2 + \alpha_3]$ in the Box) capture shifts from this trend in the post-recession period in 2009 and 2010, respectively.

To quantify the relative change in each finance variable, we also compute percentage shifts that are obtained by expressing the shifts α_2 and $\alpha_2 + \alpha_3$ from the specification as percentages of the pre-recession (2008) base of the corresponding financial variable (Y_{it}). This pre-recession base is simply the average across districts of each variable in the 2008 school year. As noted previously, local, state, and federal governments finalize their budgets in the spring prior to the budgeted year. More specifically, budgets for the 2008 school year were finalized in the spring of 2007, before the recession officially began (December 2007) and before decision makers were aware of the impending

⁷ We use ArcGIS mapping technology to represent changes in financial variables spatially. The district and MSA shape files come from the U.S. Census Bureau.

EXHIBIT 1

New York State Metropolitan and Micropolitan Statistical Areas



Notes: The map represents all metropolitan and micropolitan statistical areas in New York State, as defined by the Office of Management and Budget in 2009. A metro area contains a core urban area with a population of 50,000 or more, and a micro area contains an urban core with a population of 10,000 to 50,000. The metro areas that we focus on in our analysis by metro area are Albany, Buffalo, Ithaca, Nassau, New York City, Rochester, and Syracuse. These are shaded dark blue in the map. In the case of Ithaca, we pool four areas (Binghamton, Cortland, Elmira, and Ithaca, all of which are metro areas except Cortland, which is a micro area). In the case of the New York City MSA, we consider its component metropolitan divisions—New York City and Nassau-Suffolk (“Nassau”)—as separate metro areas.

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:

$$Y_{it} = \alpha_1 t + \alpha_2 v_1 + \alpha_3 v_2 + \alpha_4 X_{it} + f_i + \varepsilon_{it},$$

where Y_{it} is a financial indicator for school district i in year t ; t is a time trend variable that equals 0 in the immediate pre-recession year (2008) and increases by 1 for each subsequent year and decreases by 1 for each previous year; v_1 is the recession dummy, $v_1 = 1$ if year > 2008 and 0 otherwise; v_2 is the stimulus dummy, $v_2 = 1$ if year > 2009 and 0 otherwise; X_{it} represents the school district demographic characteristics (racial

composition and percentage of students eligible for free or reduced-price lunches); and f_i denotes district fixed effects.

The coefficient on the time trend variable, α_1 , denotes the overall trend in the financial indicator in the pre-recession period. The intercept shift coefficient, α_2 , denotes whether there was an intercept shift (from the pre-recession trend) in the first year after recession, and α_3 captures any additional shift in 2009-10, the year ARRA was implemented and school districts received an infusion of funds under the federal stimulus. In Tables 2 through 7, we define α_2 as “recession” and α_3 as “stimulus.” The shifts relative to pre-existing trends in 2009 and 2010 are captured by α_2 and $(\alpha_2 + \alpha_3)$, respectively.

All financial variables are inflation-adjusted to 2009 dollars. All regressions reported in the article include district fixed effects. Demographic controls and robust standard errors are used in all regressions. The results are robust, to the inclusion or exclusion of covariates.

recession. Therefore, 2008 is taken as the last pre-recession year in this article.

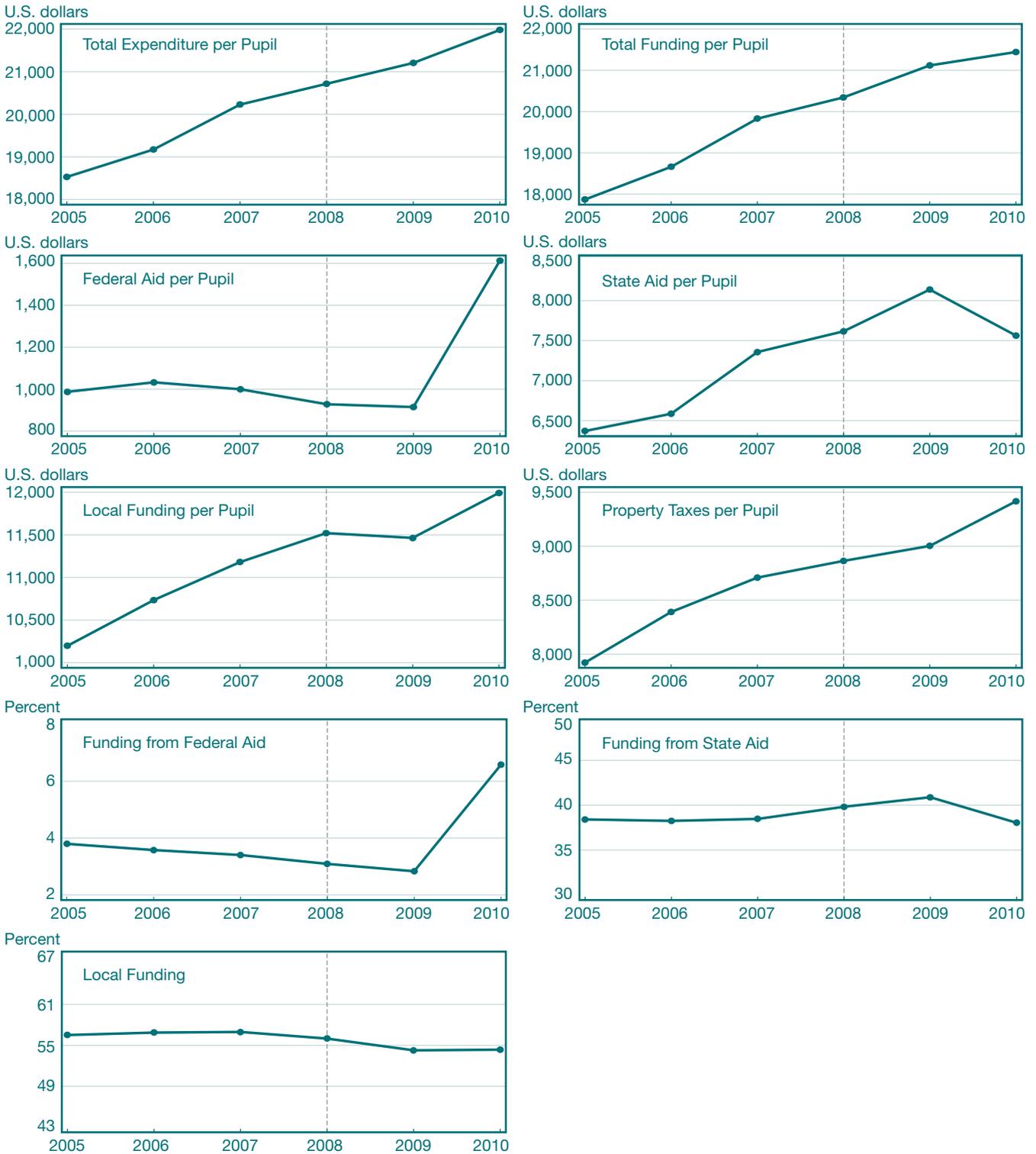
These percentage effects allow for a clearer interpretation and are more informative than simply looking at the coefficients (α_2 and α_3) because they give an idea about the size of the effects and can be easily compared with one another. In our discussion, we will focus on two percentage shifts: first, the 2009 percentage shift immediately following the recession, calculated as $\frac{\alpha_2}{\text{pre-recession base}}$ for each finance variable (Y_{it}); and second, the percentage shift in 2010, calculated as $\frac{\alpha_2 + \alpha_3}{\text{pre-recession base}}$ for each finance variable (Y_{it}). The first percentage shift captures the effect of the recession in 2009 and the latter captures the combined effect of the recession and the federal stimulus in 2010.

An important caveat relating to the strategy above should be mentioned here. The estimates from the specification capture shifts from the pre-existing trend

of the corresponding financial variables. However, these specifications do not control for any other shocks following the recession that might also have affected these financial variables. To the extent that there were such shocks, our estimates would be biased. 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 conducted some research to assess the presence of shocks (for example, policy changes) that might affect our outcome variables of interest independently of the recession and stimulus. We found no evidence of such shocks during this period.

CHART 1

Trends in School Revenues and Expenditures in New York State during the Great Recession



Notes: School years are expressed as the year corresponding to the spring semester. Dotted lines mark the immediate pre-recession (2007-08) school year.

CHART 2

Trends in Composition of Expenditures in New York State during the Great Recession



Notes: School years are expressed as the year corresponding to the spring semester. Dotted lines mark the immediate pre-recession (2007-08) school year.

6. RESULTS

6.1 Overall Patterns

Chart 1 shows trends in various aggregate school finance variables. The dotted vertical line marks the immediate pre-recession (2007-08) school year. There is not much evidence of shifts in expenditure or revenue per pupil; both remained on trend. As expected, federal aid per pupil and the federal share in total funding show a steep increase in 2009-10, the year of the federal stimulus funding. State aid per pupil, as well as the share of state aid, exhibits a decline in 2009-10 as the federal stimulus came in. Local funding per pupil, as well as its share, declined after the recession (relative to trend).

Chart 2 focuses on the various components of expenditure. There is no evidence of effects on instructional expenditure; however, several noninstructional categories (transportation, student services per pupil, and student activities per pupil) show some flattening after the recession. Next, we investigate whether these patterns hold up in a more formal trend shift analysis.

Table 2 presents results from estimation of the specification. The setup of the table establishes the pattern for the five tables that follow. The top part of each panel presents the percentage shifts, while the lower part presents the regression estimations from which the percentage shifts were derived. Our discussion of results will focus on these percentage shifts. The first row presents the percentage shift in

TABLE 2

Funding and Expenditures per Pupil during the Financial Crisis and the Federal Stimulus Period

Panel A	Total Expenditure per Pupil	Total Funding per Pupil	Federal Aid per Pupil	State Aid per Pupil	Local Funding per Pupil	Property Taxes per Pupil
Percentage shift in 2008-09	-0.410	-0.743	5.674	3.377***	-5.060***	-2.517 *
Percentage shift in 2009-10	1.985	-2.348	126.844***	-6.285***	-6.673***	-2.467
Pre-recession base	23,580.53	22,724.17	705.01	7,883.87	13,914.50	10,172.06
Trend	940.3*** (125.4)	1035.8*** (120.0)	-4.3 (12.8)	412.5*** (14.0)	629.632*** (112.738)	420.400*** (92.307)
Recession	-96.7 (310.8)	-168.9 (275.3)	40.0 (42.9)	266.3*** (50.2)	-704.125*** (222.578)	-256.041* (138.652)
Stimulus	564.7 (369.4)	-364.7 (317.7)	854.3*** (63.6)	-761.7*** (59.3)	-224.341 (245.825)	5.074 (185.666)
Observations	4,146	4,146	4,146	4,146	4,146	4,146
R ²	0.88	0.91	0.85	0.96	0.94	0.96

Panel B	Percentage Federal Aid	Percentage State Aid	Percentage Local Funding	Total Number of Students
Percentage shift in 2008-09	-2.134	2.664***	-3.512***	-0.163
Percentage shift in 2009-10	126.798***	-5.509***	-3.154***	1.151
Pre-recession base	3.09	39.83	56.00	3889.72
Trend	-0.229*** (0.018)	0.402*** (0.037)	-0.100*** (0.038)	-37.653*** (9.337)
Recession	-0.066 (0.053)	1.061*** (0.112)	-1.967*** (0.116)	-6.342 (30.835)
Stimulus	3.987*** (0.070)	-3.255*** (0.116)	0.201 * (0.109)	51.128 (38.394)
Observations	4,146	4,146	4,146	4,146
R ²	0.90	0.99	0.99	1.00

Notes: Robust standard errors are in parentheses. All regressions include school district fixed effects and control for racial composition and percentage of students eligible for free or reduced-price lunch. The pre-recession base is expressed in 2009 constant dollars.

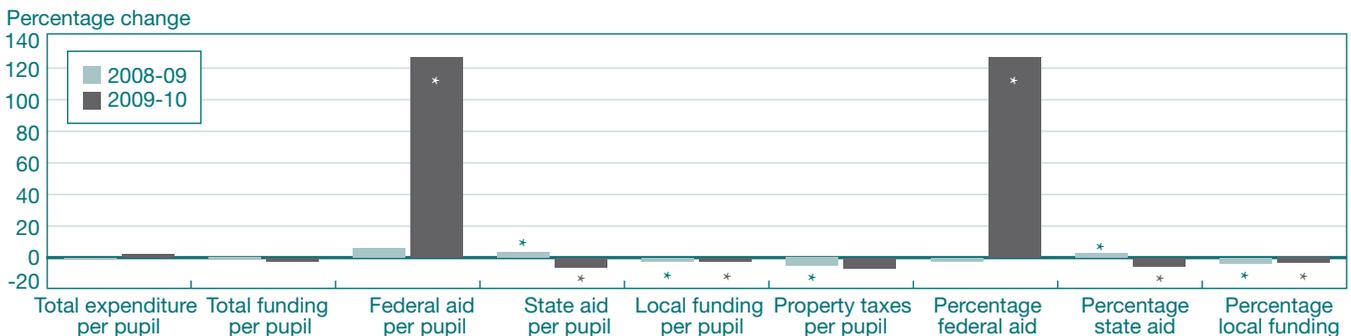
* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

CHART 3

Changes in Revenue during the Financial Crisis and the Federal Stimulus Period



Note: Asterisk (*) denotes significance at the 10, 5, or 1 percent level.

2009 $\left(\frac{\alpha_2}{\text{pre-recession base}}\right)$ and captures the effect of the recession. The second row gives the percentage shift in 2010 $\left(\frac{\alpha_2 + \alpha_3}{\text{pre-recession base}}\right)$ and captures the combined effect of federal stimulus funding and the recession. The third row shows the district average pre-recession base of the relevant dependent variable. The bottom section of each panel shows the regression estimation results that are used to calculate the percentage shifts. “Trend” corresponds to α_1 , “recession” to α_2 , and “stimulus” to α_3 . For ease of comparison, these percentage shifts are also presented in bar charts.

Table 2 and Chart 3 show that, overall, New York State school districts maintained the trend of total funding and total expenditure per pupil during the recession. The composition of funding changed following the recession. In 2008-09, local funding shifted downward and state aid filled in the gap by shifting upward. Federal aid per pupil more than doubled in the 2009-10 school year relative to the pre-recession trend. This coincided with downward shifts in state and local funding per pupil (relative to the pre-recession trend). Thus, there seems to have been a substitution of funds away from state and local funds and toward federal funds. The increased reliance on federal aid is also evidenced by the maps in Exhibit 2. On average, New York districts received 3 percent of their funding from federal sources in 2007-08. However, they received more than 7 percent of their funding from federal sources after the start of the ARRA money in 2009-10. This uptick in and increased reliance on federal aid stem from the fiscal stimulus, which sought to prevent serious budget cuts given declining state and local funding.

While overall expenditure remained on trend, the composition of expenditure shows interesting changes (Table 3 and Chart 4). Districts maintained instructional and instructional support expenditures on trend.⁸ Since classroom expenditures and teachers most directly affect student learning, they are likely to be undesirable targets for budget cuts. Additionally, teachers’ salaries make up a large portion of instructional spending, and reducing expenditures in this area is difficult, since it involves contract renegotiations or layoffs.

The noninstructional expenditures per pupil, especially transportation, student activities, and utilities and maintenance, faced cuts in both years after the onset of the recession (relative to the pre-recession trend), especially in 2010. Expenditures for student

⁸ Note that while some of the percentage shifts are negative, they are small and never statistically different from zero.

services also trended downward, but the decline was not statistically significant.⁹

6.2 Examining the Heterogeneity of Effects by Poverty Level

While the above analysis focuses on aggregate patterns, the rest of this article investigates whether there were differences in impact within the state by various characteristics such as poverty level, location, and urban status. To save space, this analysis focuses only on a subset of the finance indicators analyzed above—the various components of expenditure, which are the indicators of greatest interest. This analysis provides valuable insight into how the different types of districts allocated funds and how the students in these districts were affected. Results for the other indicators are available on request.

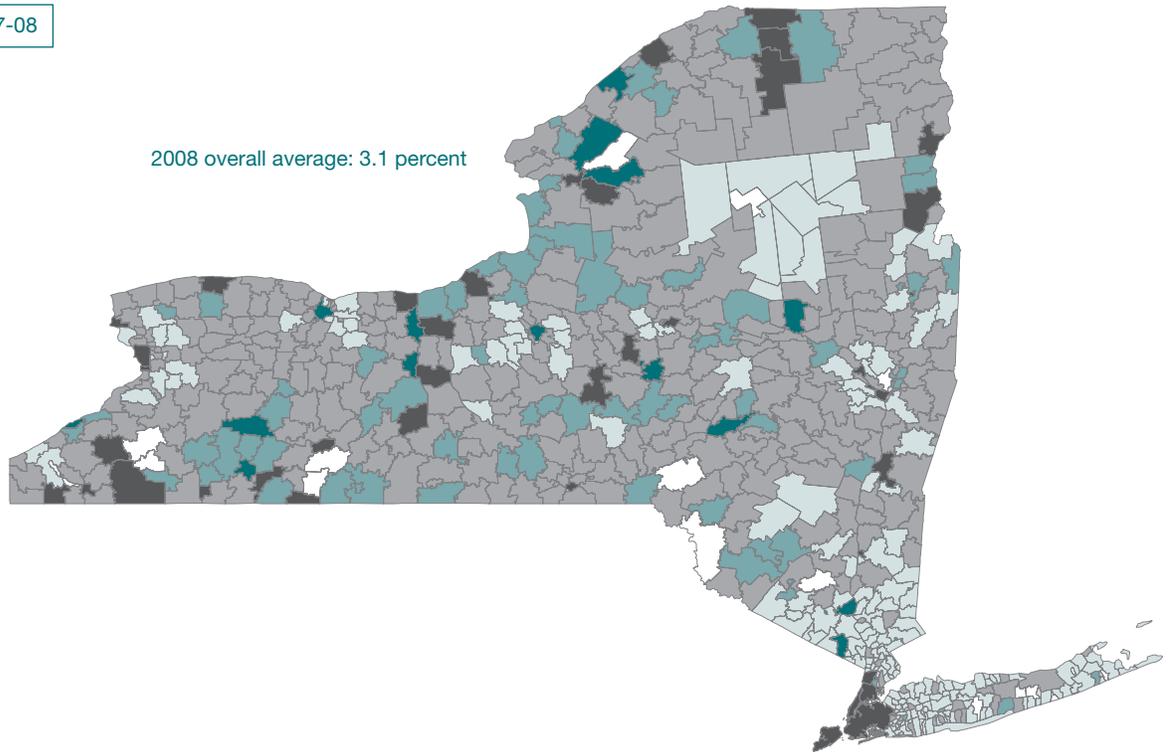
In this section, we investigate whether there were variations in effects across different poverty levels. As Table 4 and Chart 5 show, instructional expenditure declined (relative to trend) only in the low-poverty districts (and this was statistically significant only in 2009). In contrast, cuts to noninstructional spending were much more widespread. Transportation and utilities suffered significant decreases in both 2009 and 2010 in medium- and low-poverty districts. Student services also decreased in low-poverty districts in both years, but the decline was not statistically significant. Surprisingly, medium-poverty districts experienced statistically significant increases in student services expenditures in both years. None of the three groups of districts experienced a statistically significant shift in instructional support per pupil.

⁹ Note that it is not inconsistent that relative to corresponding pre-existing trends, several noninstructional expenditure categories shifted downward but the overall expenditure did not. This is because these shifts are relative to the corresponding variables’ pre-existing trends, which, in turn, differed between variables. Additionally, we do see a positive change in instructional expenditure in 2009-10, although it is not statistically significant. Instructional expenditure plays a much larger role in total expenditure than most of the noninstructional components, so when considering the overall effect, we cannot treat the subcomponents equally.

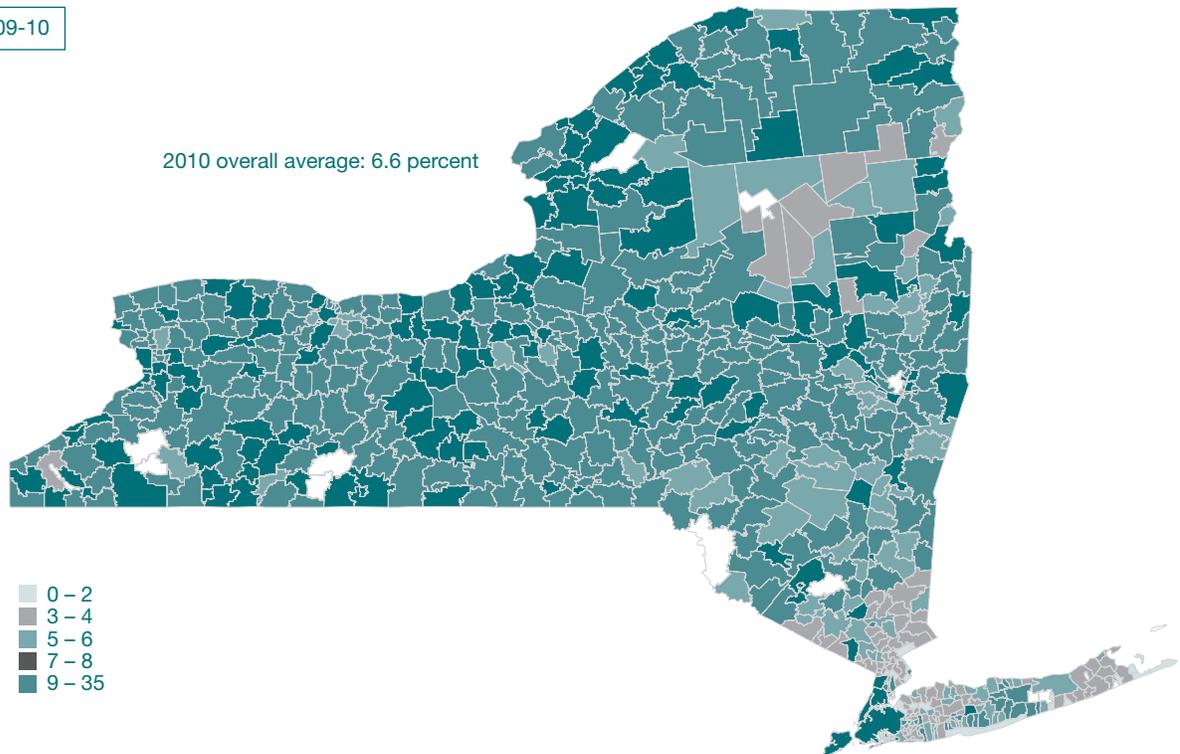
It is worth thinking about why spending in multiple noninstructional categories showed declines (relative to trend), although total expenditure was maintained on trend. This is likely because school districts anticipated future declines in funding and expenditure. Revenues from state and local funding sources declined drastically because of the Great Recession, and the primary reason that school districts’ overall funding was maintained on trend was the influx of the federal stimulus aid from ARRA funding. It was widely known that the stimulus funding was temporary and would dry up in a couple of years (which it did). Thus, it is plausible that districts anticipated sharp funding cuts in the near future and responded by cutting spending in nonessential noninstructional categories.

EXHIBIT 2
Percentage of District Revenue from Federal Sources

2007-08



2009-10



Sources: New York Office of the State Comptroller; authors' calculations.

TABLE 3

Composition of Expenditures during the Financial Crisis and the Federal Stimulus Period

Panel A	Instructional Spending per Pupil	Instructional Support Spending per Pupil	Student Services Spending per Pupil
Percentage shift in 2008-09	-0.245	-0.109	-1.091
Percentage shift in 2009-10	1.131	-0.785	-0.980
Pre-recession base	11,064.65	886.47	652.02
Trend	334.9*** (59.6)	28.8*** (3.2)	17.2*** (4.7)
Recession	-27.2 (123.2)	-1.0 (8.7)	-7.1 (12.1)
Stimulus	152.3 (163.0)	-6.0 (14.5)	0.7 (13.6)
Observations	4,146	4,146	4,146
R ²	0.92	0.88	0.91

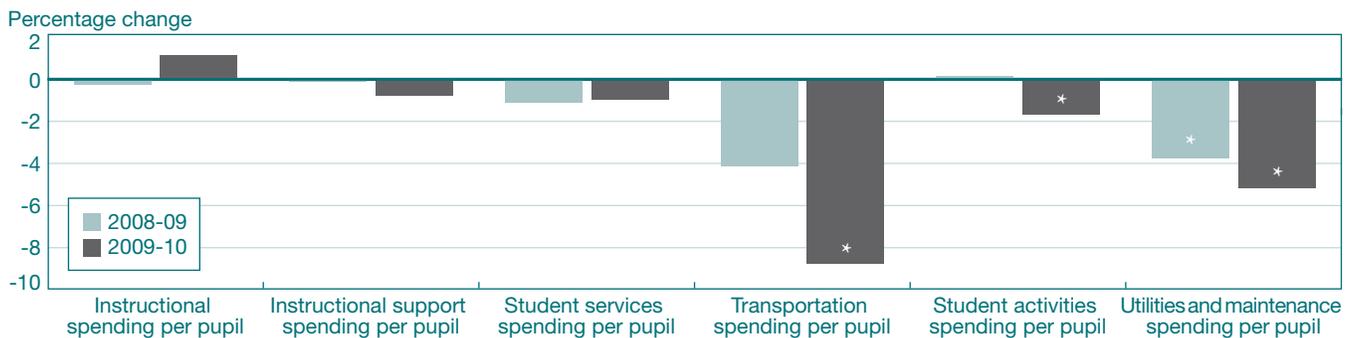
Panel B	Transportation Spending per Pupil	Student Activities Spending per Pupil	Utilities and Maintenance Spending per Pupil
Percentage shift in 2008-09	-4.130	0.151	-3.760**
Percentage shift in 2009-10	-8.753**	-1.676*	-5.188**
Pre-recession base	1,198.24	264.17	5,692.08
Trend	76.9*** (20.3)	9.7*** (0.6)	272.3*** (63.6)
Recession	-49.5 (43.5)	0.4 (1.8)	-214.0*** (98.9)
Stimulus	-55.4 (46.8)	-4.8** (2.0)	-81.2 (117.9)
Observations	4,146	4,146	4,146
R ²	0.83	0.96	0.95

Notes: Robust standard errors are in parentheses. All regressions include school district fixed effects and control for racial composition and percentage of students eligible for free or reduced-price lunch. The pre-recession base is expressed in 2009 constant dollars.

- * Significant at the 10 percent level.
- ** Significant at the 5 percent level.
- *** Significant at the 1 percent level.

CHART 4

Changes in Expenditures during the Financial Crisis and the Federal Stimulus Period



Note: Asterisk (*) denotes significance at the 10, 5, or 1 percent level.

TABLE 4

Expenditures by School District Poverty Status

Panel A	Instructional Spending per Pupil			Instructional Support Spending per Pupil			Student Services Spending per Pupil		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
Percentage shift in 2008-09	2.663	0.255	-3.990*	-0.164	0.879	-2.308	0.062	1.554*	-5.020
Percentage shift in 2009-10	5.126	1.940**	-3.954	-1.149	0.918	-4.332	-2.128	2.371*	-3.781
Pre-recession base	11,341.13	9,390.48	13,902.44	924.67	863.43	890.95	719.85	516.88	835.32
Trend	455.4***	214.3***	448.8**	26.2***	29.0***	32.3***	37.1***	10.5***	21.3**
	(106.3)	(17.8)	(188.9)	(5.3)	(2.9)	(8.4)	(13.2)	(1.4)	(10.1)
Recession	302.0	23.9	-554.6*	-1.5	7.6	-20.6	0.4	8.0*	-41.9
	(316.7)	(48.6)	(335.0)	(16.7)	(9.0)	(24.4)	(36.0)	(4.5)	(29.2)
Stimulus	279.3	158.2**	5.0	-9.1	0.3	-18.0	-15.8	4.2	10.3
	(474.8)	(71.0)	(395.0)	(17.5)	(10.8)	(43.7)	(46.3)	(5.5)	(22.7)
Observations	1,059	2,010	1,077	1,059	2,010	1,077	1,059	2,010	1,077
R ²	0.86	0.95	0.94	0.85	0.91	0.88	0.88	0.96	0.95

Panel B	Transportation Spending per Pupil			Student Activities Spending per Pupil			Utilities and Maintenance Spending per Pupil		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
Percentage shift in 2008-09	9.609	-4.884***	-15.356***	0.554	-0.468	0.858	0.138	-2.265***	-8.919**
Percentage shift in 2009-10	-1.169	-5.676***	-22.873**	-1.684	-2.820**	-0.628	0.854	-2.756**	-13.804**
Pre-recession base	1,119.58	1,108.20	1,444.92	218.07	262.53	313.60	5703.77	4715.30	7498.22
Trend	62.6**	44.4***	144.6**	7.1***	10.9***	10.5***	247.3***	180.5***	444.2**
	(27.0)	(3.4)	(64.7)	(1.5)	(0.7)	(1.3)	(40.8)	(14.7)	(209.1)
Recession	107.6	-54.1***	-221.9***	1.2	-1.2	2.7	7.9	-106.8***	-668.8**
	(144.7)	(11.1)	(79.7)	(3.5)	(2.4)	(4.2)	(117.0)	(38.7)	(340.2)
Stimulus	-120.7	-8.8	-108.6	-4.9	-6.2**	-4.7	40.9	-23.1	-366.2
	(145.8)	(11.8)	(103.3)	(3.4)	(2.6)	(4.6)	(178.1)	(51.6)	(422.0)
Observations	1,059	2,010	1,077	1,059	2,010	1,077	1,059	2,010	1,077
R ²	0.66	0.93	0.89	0.93	0.95	0.97	0.95	0.96	0.95

Notes: Robust standard errors are in parentheses. All regressions include school district fixed effects and control for racial composition and percentage of students eligible for free or reduced-price lunch. The pre-recession base is expressed in 2009 constant dollars.

* Significant at the 10 percent level.

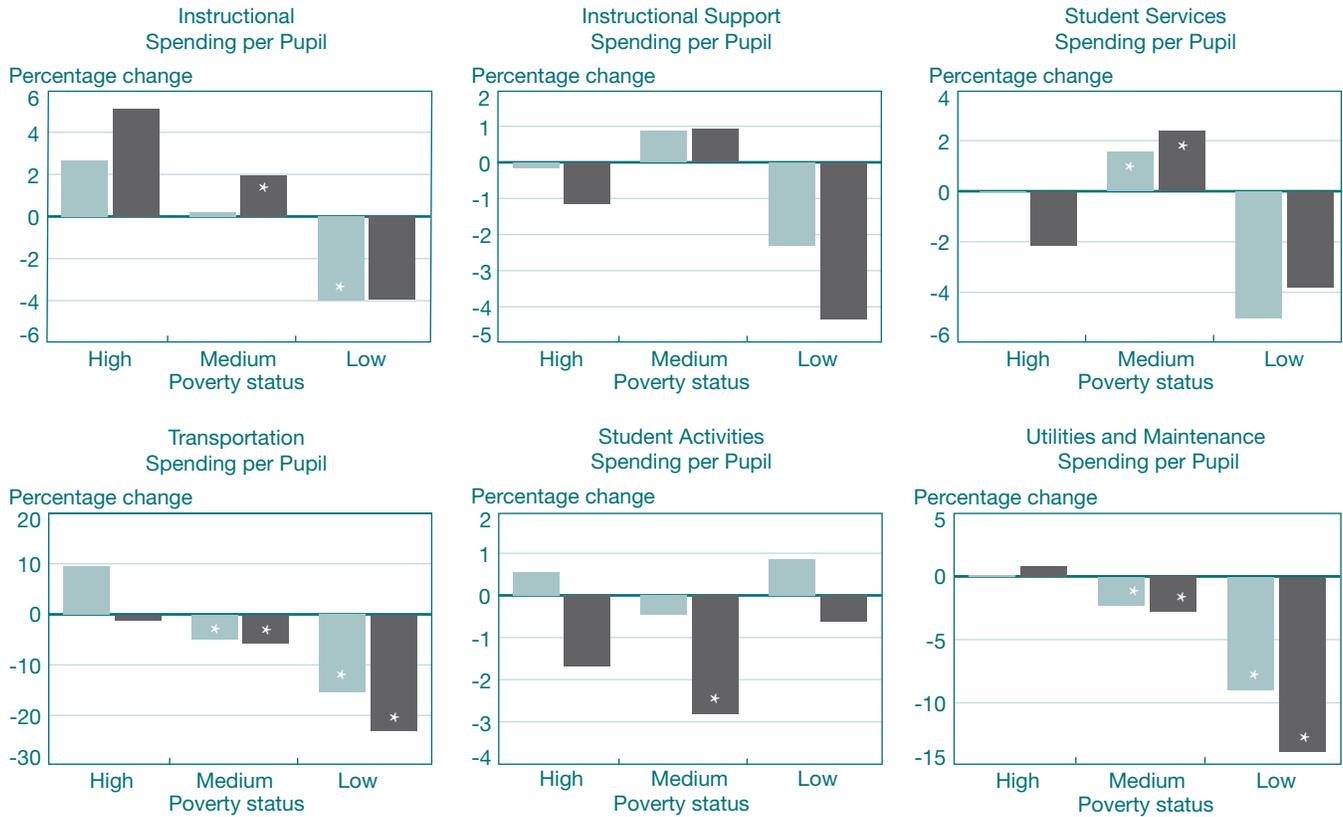
** Significant at the 5 percent level.

*** Significant at the 1 percent level.

CHART 5

Changes in Expenditures by School District Poverty Status

2008-09
2009-10



Note: Asterisk (*) denotes significance at the 10, 5, or 1 percent level.

To summarize, high-poverty districts were relatively unaffected and did not see a statistically significant change in any expenditure category. Districts in the middle had mixed experiences, boosting instructional expenditure and student services overall while cutting spending for transportation, student activities, and utilities. Low-poverty districts were the most affected, experiencing economically significant declines in all categories, many of which were statistically significant.

6.3 Did Urban Status Matter?

There were marked differences in how school finances in urban, suburban, and rural districts were affected by the Great Recession. As Table 5 and Chart 6 show, all district types maintained instructional spending: while some of the shifts were negative, they were never statistically different from zero. Additionally, there were no statistically significant shifts in instructional support or student services. Transportation spending fell by a large and statistically significant amount in both urban and rural districts for both years but did not change significantly for suburban districts. Spending on utilities fell in both years in urban and rural districts (although only the 2009 decrease was significant in rural districts).

TABLE 5

Expenditures by School District Urban Status

Panel A	Instructional Spending per Pupil			Instructional Support Spending per Pupil			Student Services Spending per Pupil		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
Percentage shift in 2008-09	-1.377	0.747	-1.115	0.668	0.426	-1.002	1.501	-2.187	-1.022
Percentage shift in 2009-10	-3.305	3.701	0.855	0.757	-0.871	-1.497	-0.033	-2.619	1.661
Pre-recession base	9,617.69	1,2031.65	10,855.3	7,95.1	808.81	991.42	468.94	826.95	584.16
Trend	189.8* (105.8)	378.1*** (101.2)	376.9*** (63.3)	22.3*** (4.6)	24.0*** (4.2)	37.1*** (5.7)	10.5*** (2.3)	22.7** (9.8)	19.7*** (5.6)
Recession	-132.4 (174.3)	89.9 (224.9)	-121 (165.1)	5.3 (13.0)	3.4 (11.2)	-9.9 (16.9)	7.0 (6.3)	-18.1 (23.3)	-6 (17.7)
Stimulus	-185.4 (173.9)	355.4 (325.6)	213.8 (215.0)	0.7 (13.6)	-10.5 (13.5)	-4.9 (28.9)	-7.2 (7.1)	-3.6 (20.7)	15.7 (24.1)
Observations	797	1,511	1,831	797	1,511	1,831	797	1,511	1,831
R ²	0.94	0.91	0.94	0.84	0.86	0.89	0.92	0.95	0.87

Panel B	Transportation Spending per Pupil			Student Activities Spending per Pupil			Utilities and Maintenance Spending per Pupil		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
Percentage shift in 2008-09	-6.541***	6.899	-10.224***	-1.445	0.385	0.26	-4.217**	-2.364	-4.823*
Percentage shift in 2009-10	-10.534***	-3.596	-9.773**	-3.667**	-0.634	-2.21	-7.489**	-1.416	-5.754
Pre-recession base	891.03	1,100.15	1,416.62	231.47	261.93	279.55	4,727.63	5,598.72	6,180.89
Trend	34.6*** (5.4)	71.2** (29.6)	90.8*** (22.3)	9.3*** (0.9)	6.7*** (1.0)	12.3*** (1.0)	98.4 (69.3)	183.0*** (52.2)	325.0*** (70.0)
Recession	-58.3*** (15.4)	75.9 (99.3)	-144.8*** (44.1)	-3.3 (2.8)	1.0 (2.4)	0.7 (3.2)	-199.4** (87.9)	-132.3 (104.5)	-298.1* (175.2)
Stimulus	-35.6** (15.9)	-115.5 (109.6)	6.4 (52.9)	-5.1* (2.9)	-2.7 (2.9)	-6.9** (3.5)	-154.7 (110.5)	53 (143.6)	-57.5 (207.6)
Observations	797	1,511	1,831	797	1,511	1,831	797	1,511	1,831
R ²	0.91	0.63	0.90	0.97	0.97	0.94	0.96	0.97	0.95

Notes: Robust standard errors are in parentheses. All regressions include school district fixed effects and control for racial composition and percentage of students eligible for free or reduced-price lunch. The pre-recession base is expressed in 2009 constant dollars.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

CHART 6
Changes in Expenditures by School District Urban Status



Note: Asterisk (*) denotes significance at the 10, 5, or 1 percent level.

Urban school districts additionally saw a drop in student activities expenditure in both years (significant only in the latter year). Overall, urban and rural districts experienced stronger declines in noninstructional spending than did suburban districts.

6.4 Examining Spatial Heterogeneities— Were There Variations across Metropolitan Areas?

Next, we investigate whether there were variations in experience across metropolitan areas. The results are presented in Tables 6 and 7 and Charts 7 and 8. All metro areas maintained or increased instructional spending except Nassau, where instructional spending shifted downward. However, while almost all metro

areas fared well in terms of instructional expenditures, they saw significant declines in various noninstructional categories. All metro areas experienced economically significant declines in transportation expenditure, and most of these declines were statistically significant. Nassau was particularly hard-hit in noninstructional expenditure as well. It experienced the largest decline in transportation and utilities spending in both years among any of the seven metro areas analyzed. Its expenditures on student activities and student services saw a small and insignificant increase.

After Nassau, New York City was the area that experienced the biggest declines in some noninstructional expenditure categories, particularly student activities and utilities. New York City also experienced a small (statistically insignificant) decline in instructional expenditure in 2009. In 2010, while New York City

TABLE 6

Expenditures by Metropolitan Area: Albany, Buffalo, New York City, and Syracuse

Panel A	Instructional Spending per Pupil				Instructional Support Spending per Pupil				Student Services Spending per Pupil			
	Albany	Buffalo	NYC	Syracuse	Albany	Buffalo	NYC	Suburban	Albany	Buffalo	NYC	Syracuse
Percentage shift in 2008-09	-0.174	2.050	-0.256	0.506	1.879	-0.472	0.036	-0.292	-0.001	1.420	-0.874	0.252
Percentage shift in 2009-10	3.177	3.861***	2.181	3.595*	-0.528	-1.914	-0.513	-1.014	0.053	3.284	-2.074	0.770
Pre-recession base	9,934.55	8,117.35	12,756.70	8,182.69	728.39	746.29	924.59	833.33	510.45	450.52	850.07	414.48
Trend	131.7 (110.5)	99.8*** (25.1)	190.9*** (44.1)	165.5*** (39.7)	22.2*** (7.5)	21.2*** (4.7)	11.8 (7.9)	17.5*** (5.8)	10.3* (5.5)	6.0** (2.3)	36.0*** (6.1)	7.1* (3.9)
Recession	-17.3 (182.7)	166.4 (104.8)	-32.7 (140.9)	41.4 (119.6)	13.7 (17.3)	-3.5 (15.8)	0.3 (23.2)	-2.4 (20.4)	-0.0 (11.4)	6.4 (6.5)	-7.4 (14.2)	1.0 (10.8)
Stimulus	332.9 (257.9)	147.0 (111.5)	310.9 (228.7)	252.7* (138.7)	-17.5 (20.6)	-10.8 (16.8)	-5.1 (33.4)	-6.0 (20.5)	0.3 (11.5)	8.4 (7.2)	-10.2 (14.4)	2.1 (10.7)
Observations	372	252	335	257	372	252	335	257	372	252	335	257
R ²	0.97	0.91	0.97	0.89	0.78	0.85	0.88	0.93	0.95	0.92	0.92	0.83
Panel B	Transportation Spending per Pupil				Student Activities Spending per Pupil				Utilities and Maintenance Spending per Pupil			
	Albany	Buffalo	NYC	Syracuse	Albany	Buffalo	NYC	Suburban	Albany	Buffalo	NYC	Syracuse
Percentage shift in 2008-09	-4.382	-4.865**	-1.485	-1.508	1.017	-0.271	-2.110	3.297*	-2.631	-0.702	-5.250*	-1.896
Percentage shift in 2009-10	-7.410**	-7.065***	-4.938**	-4.774	-2.058	-2.281	-6.071***	-1.635	1.999	-0.671	-5.226	-2.361
Pre-recession base	1,117.31	957.95	1,260.53	997.57	189.50	197.11	340.14	255.76	5,552.79	3,937.37	5,976.93	3,859.24
Trend	46.4*** (9.3)	27.0*** (8.1)	29.7*** (7.4)	38.7*** (8.4)	6.7*** (0.9)	7.1*** (1.2)	13.2*** (2.3)	10.3*** (1.5)	87.8 (126.5)	75.8** (33.0)	147.0*** (50.2)	119.1*** (24.1)
Recession	-49.0 (32.8)	-46.6** (20.0)	-18.7 (18.0)	-15.0 (27.1)	1.9 (3.3)	-0.5 (3.2)	-7.2 (5.2)	8.4* (5.0)	-146.1 (186.9)	-27.6 (65.7)	-313.8* (176.4)	-73.2 (75.1)
Stimulus	-33.8 (31.0)	-21.1 (15.2)	-43.5* (23.9)	-32.6 (25.6)	-5.8 (3.8)	-4.0 (3.4)	-13.5** (5.5)	-12.6** (5.8)	257.0 (305.2)	1.2 (64.6)	1.4 (244.1)	-17.9 (78.6)
Observations	372	252	335	257	372	252	335	257	372	252	335	257
R ²	0.9	0.88	0.98	0.8	0.96	0.96	0.97	0.95	0.98	0.93	0.96	0.95

Notes: Robust standard errors are in parentheses. All regressions include school district fixed effects and control for racial composition and percentage of students eligible for free or reduced-price lunch. The pre-recession base is expressed in 2009 constant dollars.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

TABLE 7

Expenditures by Metropolitan Area: Ithaca, Nassau, and Rochester

Panel A	Instructional Spending per Pupil			Instructional Support Spending per Pupil			Student Services Spending per Pupil		
	Ithaca	Nassau	Rochester	Ithaca	Nassau	Rochester	Ithaca	Nassau	Rochester
Percentage shift in 2008-09	1.243	-4.460	1.436	3.430	-3.576	3.808	1.577	0.108	-1.058
Percentage shift in 2009-10	3.109*	-8.322*	3.277**	1.518	-3.388	8.985**	3.666	0.772	-2.771
Pre-recession base	8,395.64	15,971.95	8,438.53	9,15.59	958.42	868.50	417.94	848.25	479.09
Trend	287.2*** (35.0)	672.0*** (259.0)	145.0*** (26.2)	39.2*** (7.1)	46.1*** (13.6)	25.5*** (8.0)	14.2*** (2.6)	26.9** (10.7)	15.1*** (3.2)
Recession	104.4 (115.8)	-712.4 (462.1)	121.1 (92.6)	31.4 (24.2)	-34.3 (35.1)	33.1 (24.5)	6.6 (7.9)	0.9 (23.4)	-5.1 (10.2)
Stimulus	156.7 (145.8)	-616.7 (631.9)	155.4 (99.4)	-17.5 (27.2)	1.8 (72.0)	45.0* (25.9)	8.7 (10.7)	5.6 (31.4)	-8.2 (9.9)
Observations	252	703	348	252	703	348	252	703	348
R ²	0.84	0.94	0.87	0.89	0.88	0.81	0.87	0.90	0.88

Panel B	Transportation Spending per Pupil			Student Activities Spending per Pupil			Utilities and Maintenance Spending per Pupil		
	Ithaca	Nassau	Rochester	Ithaca	Nassau	Rochester	Ithaca	Nassau	Rochester
Percentage shift in 2008-09	-5.232**	-18.612***	-3.011	2.726	1.919	-0.200	-1.965	-9.614*	-0.688
Percentage shift in 2009-10	-9.149***	-29.410**	-4.272	0.235	1.232	-0.123	-3.829*	-18.770*	1.224
Pre-recession base	875.37	1,780.46	960.25	255.43	323.51	256.68	4,294.35	8,790.90	4,193.63
Trend	48.9*** (7.1)	215.2** (89.8)	30.3*** (6.2)	12.0*** (1.6)	11.1*** (1.9)	13.0*** (1.4)	214.0*** (23.0)	605.8** (294.2)	132.9*** (16.2)
Recession	-45.8** (22.3)	-331.4*** (125.5)	-28.9 (23.6)	7.0 (5.0)	6.2 (6.2)	-0.5 (3.8)	-84.4 (79.6)	-845.2* (504.4)	-28.9 (50.2)
Stimulus	-34.3 (23.6)	-192.3 (178.1)	-12.1 (23.0)	-6.4 (5.4)	-2.2 (7.3)	0.2 (4.7)	-80.1 (87.7)	-804.8 (684.3)	80.2 (63.3)
Observations	252	703	348	252	703	348	252	703	348
R ²	0.88	0.89	0.78	0.93	0.96	0.93	0.85	0.94	0.94

Notes: Robust standard errors are in parentheses. All regressions include school district fixed effects and control for racial composition and percentage of students eligible for free or reduced-price lunch. The pre-recession base is expressed in 2009 constant dollars.

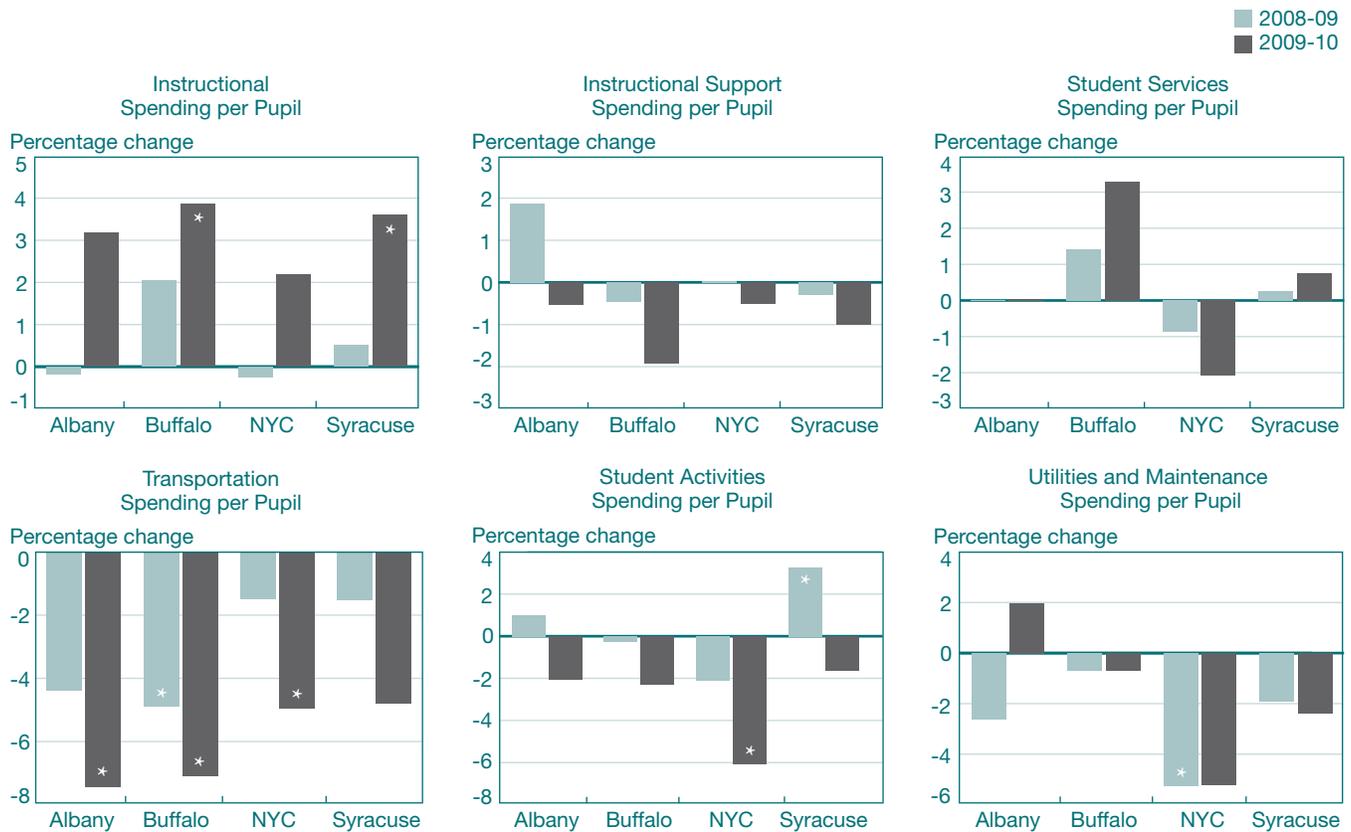
* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

CHART 7

Changes in Expenditures by Metropolitan Area: Albany, Buffalo, New York City, and Syracuse



Note: Asterisk (*) denotes significance at the 10, 5, or 1 percent level.

saw an increase in instructional expenditure relative to trend like the other metro areas, this increase was not as large as that experienced by most other metro areas and was not statistically different from zero. Rochester fared relatively well, with a modest (but statistically significant) increase in instructional spending and a significant (both economically and statistically) increase in instructional support in 2010. Rochester did not experience a statistically significant decline in any other noninstructional expenditure category.

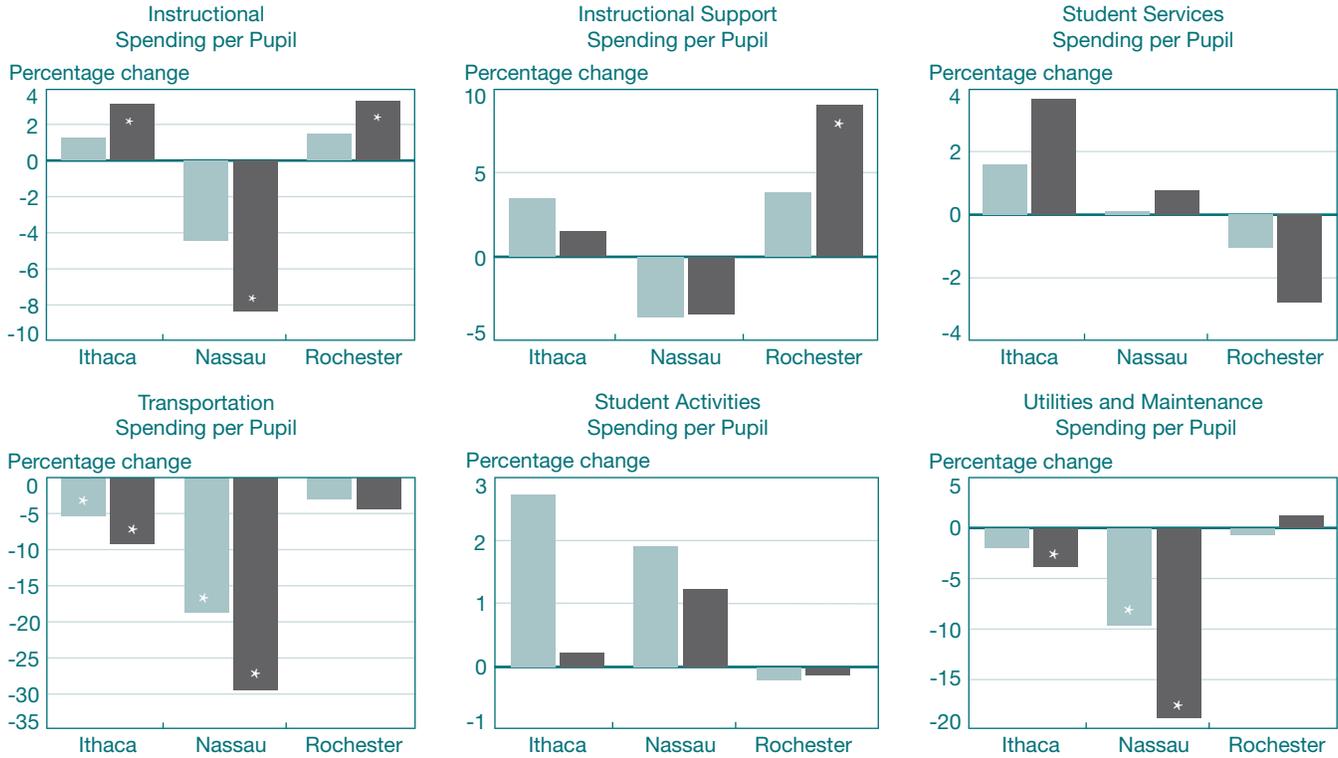
7. CONCLUSION

This article investigates school finance patterns in New York State during the Great Recession and federal stimulus period using a trend shift analysis. We do not find evidence of shifts in total school district funding or expenditure following the Great Recession. However, the composition of funding changed: the share of federal funding increased dramatically, while shares of state and local funding fell when ARRA funding began. The federal stimulus appears to have helped maintain total expenditure and instructional expenditures in the 2009-10 school year. While total expenditure did not show a shift, the composition of total expenditure

CHART 8

Changes in Expenditures by Metropolitan Area: Ithaca, Nassau, and Rochester

■ 2008-09
■ 2009-10



Note: Asterisk (*) denotes significance at the 10, 5, or 1 percent level.

changed in interesting ways. Instructional expenditure was maintained on trend, while declines occurred (relative to trend) in noninstructional expenditures, especially in transportation, utilities, and student activities. Thus, districts seem to have protected the expenditures that matter most for student learning, while expenditures in noninstructional categories suffered. In addition to these overall trends, our analysis reveals interesting variations within the state by poverty level, metro area, and urban status. Studying variations by poverty level, we find that low-poverty districts were the most affected in both instructional and noninstructional expenditures. Studying patterns by metro area reveals that New York City, and especially Nassau, were badly hit. Additionally, urban districts suffered the largest declines in funding.

Investing in education is essential to building human capital and improving children’s prospects. Recessions can have widespread and long-lasting effects in many aspects of life, far beyond the immediate short-term impact. How, exactly, the recession will affect the economy in the long run remains to be seen, but its impact on human capital development and investment will surely figure importantly in that outcome. The findings of this study should deepen our understanding of how recessions affect schools and the role policy can play in mitigating the consequences.

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