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TOUGH CHOICES:  
NEW JERSEY SCHOOLS  
DURING THE GREAT  
RECESSION AND BEYOND

Rajashri Chakrabarti and Max Livingston

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# TOUGH CHOICES: NEW JERSEY SCHOOLS DURING THE GREAT RECESSION AND BEYOND

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## OVERVIEW

- This study examines school finance patterns in New Jersey over the four years following the Great Recession, a period encompassing a severe economic downturn, an influx of federal stimulus funding, and the funding's eventual depletion.

- The authors find that school districts' funding and expenditure levels saw sharp reductions from pre-recession trends over the 2009-12 period, despite the state's \$2.23 billion in federal stimulus. The cuts increased substantially as the stimulus waned.

- Regional comparisons reveal that the Camden metro area, the highest poverty area studied, was forced to make much larger cuts in school expenditures when the federal funding receded than other areas.

- The findings have relevance for the recession driven by the COVID-19 pandemic, suggesting a widening of inequalities in school spending across metro areas and a deepening of adverse effects as relief dissipates.

State and local governments across the nation faced fiscal crises during the Great Recession and its aftermath as their revenues from income, sales, and property taxes plummeted. To help ameliorate some of the detrimental effects of the recession and to kick start the economy, the federal government passed a large stimulus bill—the American Recovery and Reinvestment Act (ARRA)—in 2009. But the ARRA was short-lived and receded at a time when state and local government revenues were still under stress. In this article we study the medium-term effects of the Great Recession on school finances in New Jersey. We also investigate whether these effects differed across metro areas in the state. Understanding the effects of these extraordinary circumstances on school finances is essential from policy, social, and scholarly perspectives. It is all the more relevant in the current scenario, since the findings from the Great Recession can provide unique insight into the possible effects of the current recession driven by the COVID-19 pandemic on school finances.

New Jersey is interesting for various reasons. It is the third highest-ranked state in the country in per pupil expenditure. It is also home to some of the poorest districts (the Abbott districts, which receive additional state funds) and some of the wealthiest districts. This wealth disparity makes

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studying New Jersey all the more interesting, and it is instructive to see whether there are variations in experiences across metro areas.

The Great Recession could affect school districts through many avenues. Districts rely on property taxes for much of their revenue; so as the housing market collapsed, their primary source of revenue was severely diminished. Districts also rely on funding from the state government, but state governments across the country faced budget crises as their income and sales tax revenues fell. To temporarily fill the gap, the federal government allocated \$100 billion to the states as part of the ARRA. However, once the stimulus money was depleted and the economy was still weak, districts were forced to make budgetary sacrifices. In this article, we build on Chakrabarti and Sutherland (2013a), which studied the immediate effect of the Great Recession in New Jersey when the stimulus funding was still flowing, to examine the effects over a longer period encompassing the recession, the stimulus, and also the withdrawal of the stimulus on school districts in the state. This investigation uses detailed panel data of school finance measures and an interrupted time series strategy for our study (see box, p. 7).

Our analysis reveals some interesting patterns. The recession led to reductions in both school funding and expenditure, even though the federal stimulus forestalled major cuts. The withdrawal of federal stimulus along with the continued declines in state and local revenues led to markedly deeper cuts in all expenditure categories in the latter years, including in instructional expenditure, the category most fundamental to student learning. Additionally, we study heterogeneity in these effects across metro areas, finding that Camden and Edison experienced the largest drops in per pupil funding and expenditure. Camden, the highest poverty area in our analysis, made the largest cuts in per pupil instructional expenditure—the expenditure category most critical to student learning—as the federal stimulus abated. Camden also sustained the largest cuts to noninstructional expenditures as the stimulus abated. In contrast, Wayne, a relatively wealthy area, experienced the smallest reduction in instructional expenditure and was the only area in our analysis to avoid statistically significant declines in its local funding. These findings imply that the funding shortages of the Great Recession affected low-income areas considerably more adversely as the stimulus funding receded. The lessons of this research are also important to keep in mind in considering the possible effects of the recession driven by COVID-19 on school finances. The analysis suggests that despite the federal relief, school districts will likely suffer declines in both funding and spending, and these cuts may further deepen as the federal relief erodes. It also indicates that cuts may be unequal across districts, affecting low-income school districts more and consequently exacerbating spending inequalities.

This article builds on and extends the literature on school district finances.<sup>1</sup> But it is more closely related to the literature that studies the impact of recessions on school finances.<sup>2</sup> This literature has documented the negative relationship between state and local funding whereby local funding increases during recessions to offset state funding cuts.<sup>3</sup> It also establishes that the federal stimulus following the Great Recession succeeded in stemming large funding and spending cuts.<sup>4</sup> The studies most closely related to this analysis include those that have examined the short-term effects of the Great Recession on New Jersey school finances.<sup>5</sup> These studies focus on the first two years after the recession when the stimulus funding was in effect and document the effects on various funding and spending categories in New Jersey

during this period or contrasts the effects in New Jersey with those in New York.<sup>6</sup> This article departs from these papers by considering the effects of the Great Recession not only over the short term, when the stimulus funding was in effect, but also over the medium term, which includes the period when the federal stimulus receded. We define short term as the two years following the recession (2009-10) and the medium term as the four years following the recession (2009-12). The longer data set in this article allows us to distinguish between three phases—the immediate post-recession period, the stimulus funding period, and the following period when the stimulus funding was drawn down but the economy still continued to be weak—and investigate whether the effects on school finances (and their components) differed between these phases. It is crucial for us to understand the impacts of the recession, its aftermath, and their interactions with policy on schools because schools play a critical role in forming human capital and in improving the long-term health of the economy.

Additionally, as mentioned above, this article has relevance for the recession driven by the COVID-19 pandemic. The sharp declines in state and local funding are expected to lead to large cutbacks in school funding. While the federal fiscal relief may moderate the effect in the short term, the effects can potentially be considerably more deleterious as this relief money wanes. By studying experiences from the Great Recession, both from the phase when the stimulus money supported schools and from the phase when the stimulus money waned, this article offers vital lessons on how the COVID-19 recession may affect schools in the short term and in the medium term.

## 1. BACKGROUND

The Great Recession placed a significant burden on state and local governments. It affected governments' revenue and budgets in a variety of ways: the downturn in housing prices, employment, income, and business activity each contributed to smaller tax revenues and larger budget gaps.

Local governments generally rely heavily on property taxes, which, in the early part of the decade, were supported by a booming housing market. House prices in the United States had been increasing at an average rate of 7.8 percent between 2000 and 2006. However, that growth turned out to be unrealistic, and as delinquencies and foreclosures increased, the bubble burst and home prices declined at an average annual rate of 4.9 percent during the recession quarters between 2007 and 2009. Housing prices in New Jersey were even more volatile than the national average, increasing at an average rate of 11.6 percent between 2000 and 2006, and then falling to an average rate of -4.7 percent in the recession quarters. Just as house prices were picking up, the New Jersey state legislature passed a law instituting a property-tax rate cap, which limited property tax increases to 2 percent per year effective January 2011.

State governments also experienced depleted revenue streams, as unemployment spikes led to less income tax revenue, and lower consumption led to less revenue from sales tax. Right in the recession, in January 2008, the New Jersey state legislature passed the School Funding Reform Act (SFRA), which called for a 7 percent increase in state funding for

K-12 education in the 2008-09 school year. This was also the first year that the recession affected district budgets. Midway through the 2009-10 school year, there was a revenue short-fall and state education funding was reduced. There were also state funding cuts in the 2010-11 school year, caused by the same fiscal crisis.<sup>7</sup> For the 2011-12 school year, some of the funding was restored, but not all: In 2011 aid was reduced for each district by 5 percent of the prior year's (2010) general fund, while in 2012 it was increased by 2 percent. So there was still a gap of approximately 3 percent of the 2010 general fund.

As an attempt to remedy the funding crises faced by the state and districts following the crisis, U.S. Congress passed the American Recovery and Reinvestment Act in February 2009, an economic stimulus package that provided an anticipated \$840 billion in new spending, with \$100 billion designated for public education. Districts were directed to use the ARRA funds to save and create jobs, to boost student achievement, and to bridge student achievement gaps.

Of the total \$100 billion designated to public education nationally, New Jersey received \$2.23 billion. The largest portion of New Jersey's appropriation was distributed based on the state funding formula, which is largely determined by the number of students, poverty, and other special needs of the district. These funds had been spent by the end of the 2010 school year.

## 2. DATA

We combine data from multiple sources to create our panel of school districts. The final data set includes 572 New Jersey school districts from 1999 through 2012.<sup>8</sup> Most of the finance data come from the New Jersey Department of Education Office of School Finance. We also obtained finance data from the National Center for Education Statistics (NCES) School Finance Survey (F-33) and the U.S. Census Bureau. Nonfinance data come from the New Jersey Department of Education Office of Data, Research, Evaluation, and Reporting; the NCES Common Core of Data (CCD); and the Bureau of Labor Statistics (BLS).

The resulting panel has data on total revenue and expenditure and their components. The components of total revenue include contributions of the federal, state, and local governments. The primary components of expenditure that we examine are instruction, instructional support, student services, transportation, student activities, and utilities and maintenance (utilities). Definitions for these variables are shown in the table. Additionally, we have data on median salary and median years of experience of both teachers and administrators in each district until 2011.<sup>9</sup> All revenue and expenditure variables are expressed in real 2012 dollars and are analyzed on a per pupil basis using the district's average daily enrollment.

We use as controls district-level data on various socioeconomic and demographic characteristics, such as enrollment, racial composition, and the percentage of students eligible for free or reduced-price lunches.

We analyze variations in impacts across metropolitan areas and study the four largest New Jersey metropolitan divisions (as defined by the U.S. Office of Management and Budget): Edison-New Brunswick, New York-White Plains-Wayne (hereafter Wayne),

TABLE

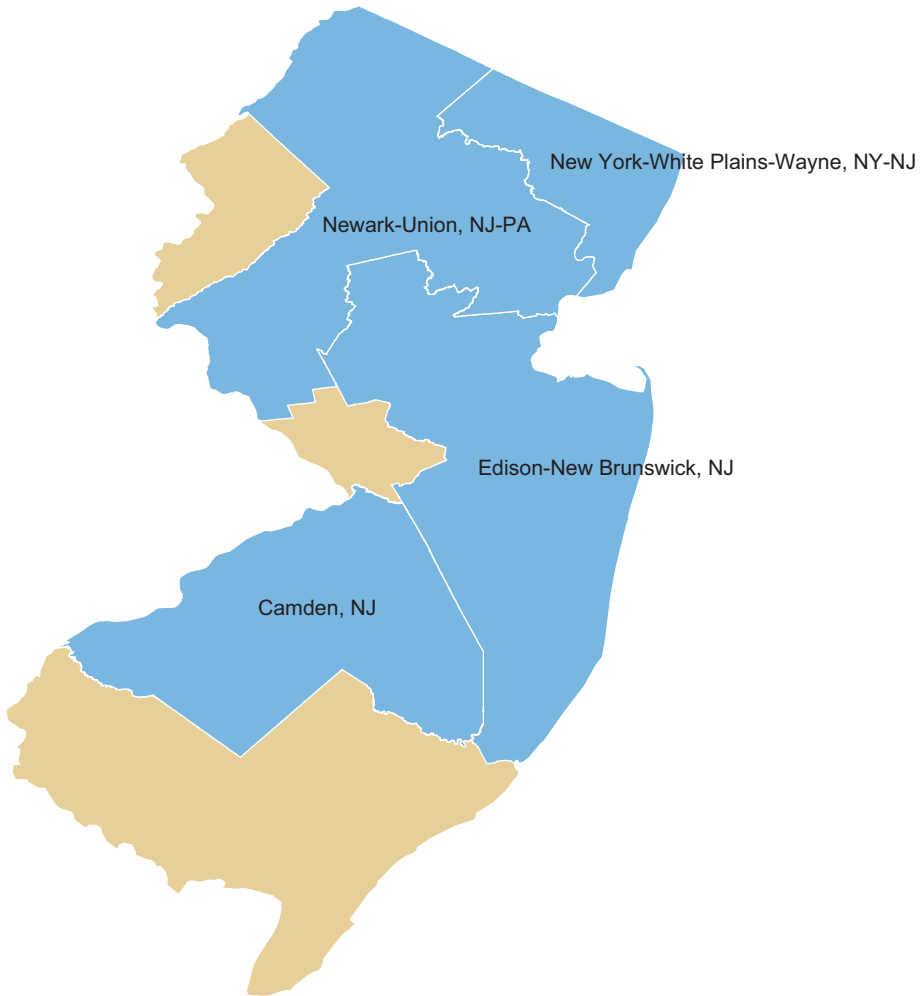
## Definitions of Expenditure Components

<b>Instructional Expenditure</b>	
Instruction	All expenditures associated with direct classroom instruction, including teacher salaries and benefits, classroom supplies, and instructional training
<b>Noninstructional Expenditure</b>	
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

Newark-Union (hereafter Newark), and Camden. Note that each metro division is a collection of school districts: Edison-New Brunswick contains 121 districts, Wayne contains 107 districts, Newark has 136 districts, and Camden has 103. We use GIS mapping technology to visualize district-level changes in funding as well as to display the metropolitan areas we use in our heterogeneity analysis. The shape files are obtained from the U.S. Census Bureau. See Exhibit 1 for a map of the areas we examine.

EXHIBIT 1

New Jersey Metropolitan Divisions



Notes: Areas in blue are the metropolitan areas examined in our heterogeneity analysis. They represent the four largest New Jersey metropolitan divisions.

## Empirical Strategy

We use an interrupted time series analysis and investigate whether the recession and federal stimulus periods were associated with shifts in various school finance indicators from their pre-existing trends.<sup>a</sup> The analysis treats the 2007-08 school year as the immediate pre-recession year based on budget timelines.<sup>b</sup> We estimate the following specification:

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

where  $Y_{it}$  is each financial indicator for school district  $i$  in year  $t$ ;  $T_t$  is a time trend variable that equals 0 in the immediate pre-recession year (2007-08) and increments 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; and  $f_i$  denotes district fixed effects.<sup>c</sup>

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 in each post-recession year.

All financial variables are inflation adjusted to 2012 dollars. All regressions reported in the article include district fixed effects. Demographic controls are used in all regressions and all regressions use standard errors clustered at the school district level. The results are robust, though, to the inclusion or exclusion of covariates.

Note that the post-recession shifts ( $\alpha_2 - \alpha_5$ ) 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 percentage shift terms. In this method, the effects are expressed as a 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 immediate effect of the recession; the shift in 2010 captures the combined effect of the recession and stimulus, with the shifts in 2011 and 2012 capturing the aftermath.

An important caveat related to the above strategy should be mentioned here. We use an interrupted time series analysis and the estimates from the above specification capture shifts from the preexisting trend of the corresponding school finance variables in each post-recession year (2009-12). Of note is that our estimates will be biased if there were shocks during the post-recession years (2009-12) that affected our financial indicators independently of the recession. However, we did extensive research to assess the presence of such potentially confounding shocks that might affect our outcome variables *independently* of the recession and stimulus. To the best of our knowledge, we are not aware of any such shocks during this period. 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, by far, be overpowered by a shock as substantial as the Great Recession and the effects obtained are likely to capture its impacts.

<sup>a</sup> Interrupted time series analysis evaluates changes in the intercept (or level) and slope of the time series at the point of the economic change or policy intervention to understand the effects of the change or intervention. It is explained in more detail in this section.

<sup>b</sup> Local, state, and federal governments finalize their budgets in the spring prior to the budgeted year. More specifically, the 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 recession. Therefore, 2008 is taken as the last pre-recession year in this article.

<sup>c</sup> In this article, we refer to school years by the year corresponding to the spring semester.



### 3. RESULTS

#### 3.1 Overall Findings

As evident in Charts 1 and 2 tracking the trends of the school finance variables of interest, funding and expenditure show a leveling off from the pre-recession trend and a slight decline in the recession years. The spike in federal aid spurred by stimulus funding is clearly visible in 2010. State aid declined sharply immediately following the recession during 2008-10, the decline being the deepest in 2010, interestingly coinciding with the marked increase in federal funding.

Funding shares of the three sources of revenue (federal, state, and local) also show major shifts. Again, the share of funding coming from the federal government exhibits a clear spike in 2010 from the stimulus. That year also saw a sharp decrease in the state's share of funding due to a combination of cuts in state aid and the increased role of federal aid. In 2011 and 2012, as federal aid fell and state aid stagnated, the role of local funding increased. This development occurred even though the actual amount of local funding stayed the same or fell in those years because those shifts were less drastic than the shifts in state and federal aid. All expenditure categories show perceptible declines from trend after the recession, with the declines being the most prominent in 2011 (Chart 2). In contrast to the expenditure categories, teacher salary and teacher experience show sizable increases. If budget cuts led school districts to lay off their untenured teachers, that would lead to increases in both median teacher salary and experience, since tenured teachers are paid more and have more years in their roles. The patterns for teacher salary and teacher experience are consistent with this hypothesis.

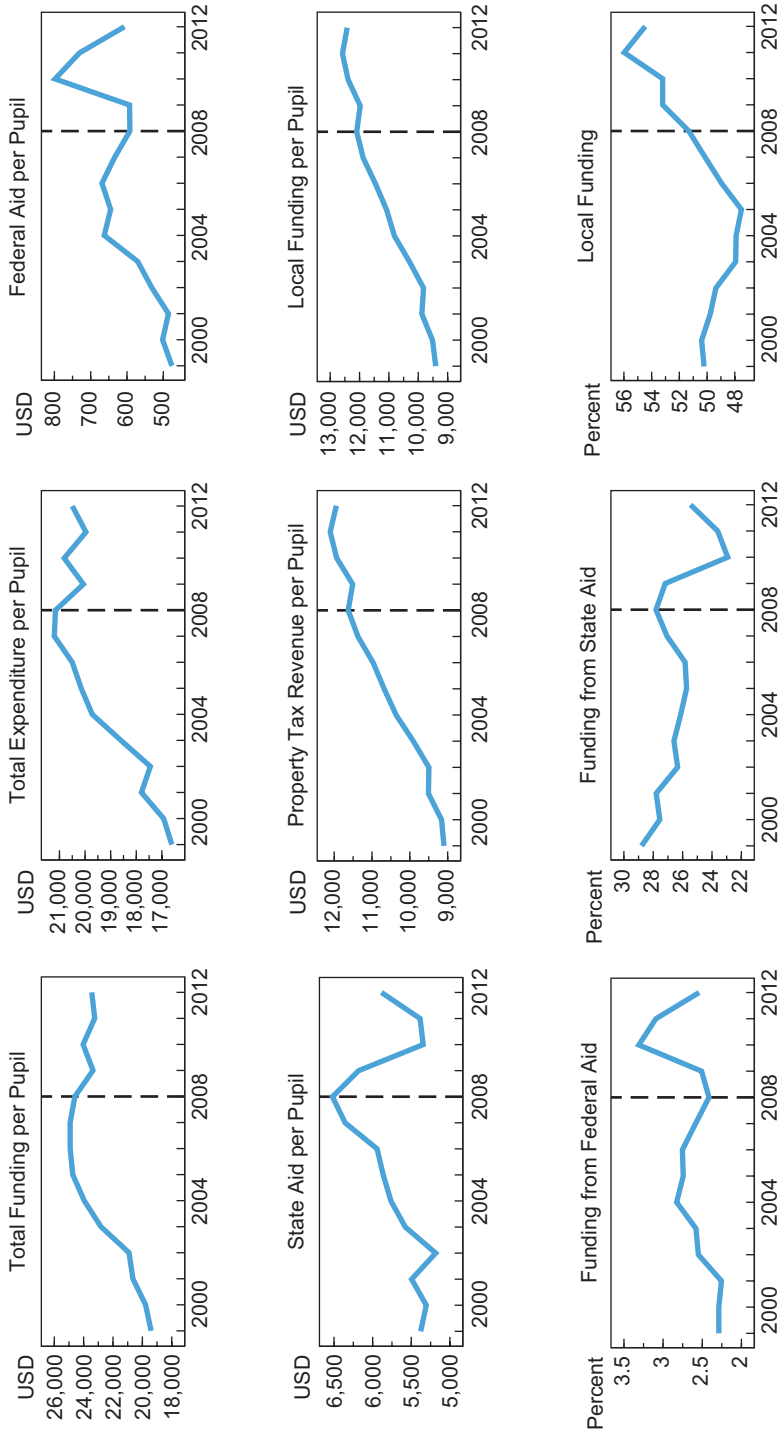
In the remainder of this section, we investigate whether these patterns in the raw data survive in a more formal interrupted time series analysis. The primary results of our trend shift analysis are presented in Appendix Table 1A and Chart 3. The top panel of Table 1A shows the percentage shifts, while the lower panel presents the regression coefficients that were used to derive the percentage shifts. For ease of comparison, we also provide bar graphs of the percentage shifts (Chart 3, see p. 12). These figures (the table and the chart) exhibit a sharp fall in per pupil funding in the first year after the recession, 2009. What is perhaps more noteworthy is that the gap (from the pre-recession trend) grows as time progresses: Each year's downward shift in per pupil funding is larger than the year before, exhibiting a downward shift of 20.8 percent relative to the trend by 2012. A similar pattern plays out for expenditure as well, with gaps increasing over time. In 2012, we see that total expenditure per pupil was 16 percent below trend.

If we look at the components of funding, the effect of the stimulus is apparent in the large, significant positive shift in federal aid per pupil in 2010. However, this infusion of funds is only specific to 2010 and is followed by declines in the years after—so much so that by 2012, federal spending is significantly below trend. Exhibit 2 shows the variation of federal aid across the state's districts and over time. The maps show that the increased role of federal aid was not isolated to a particular area, but occurred across the whole state. The fall in federal aid from 2010 to 2012 was similarly widespread.

State aid to districts showed economically and statistically significant downward shifts from trend in all four years, with the largest downward shift occurring in 2011 (Chart 3 and Table 1A).

CHART 1

### Trends in Funding and Expenditure

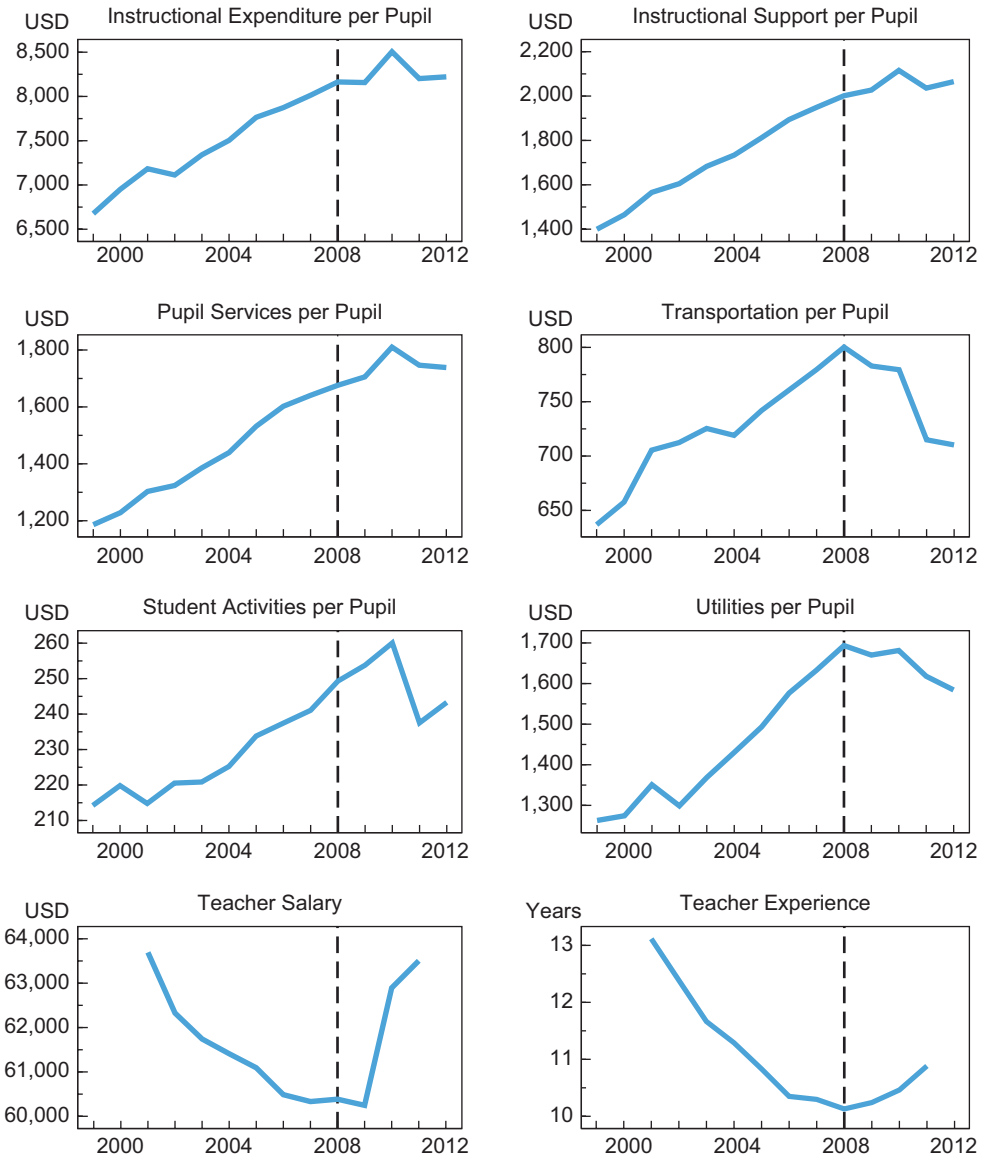


Source: Authors' calculations.

Notes: USD is U.S. dollars. School years correspond to the spring term. Dotted lines mark the immediate pre-recession school year (2007-08).

CHART 2

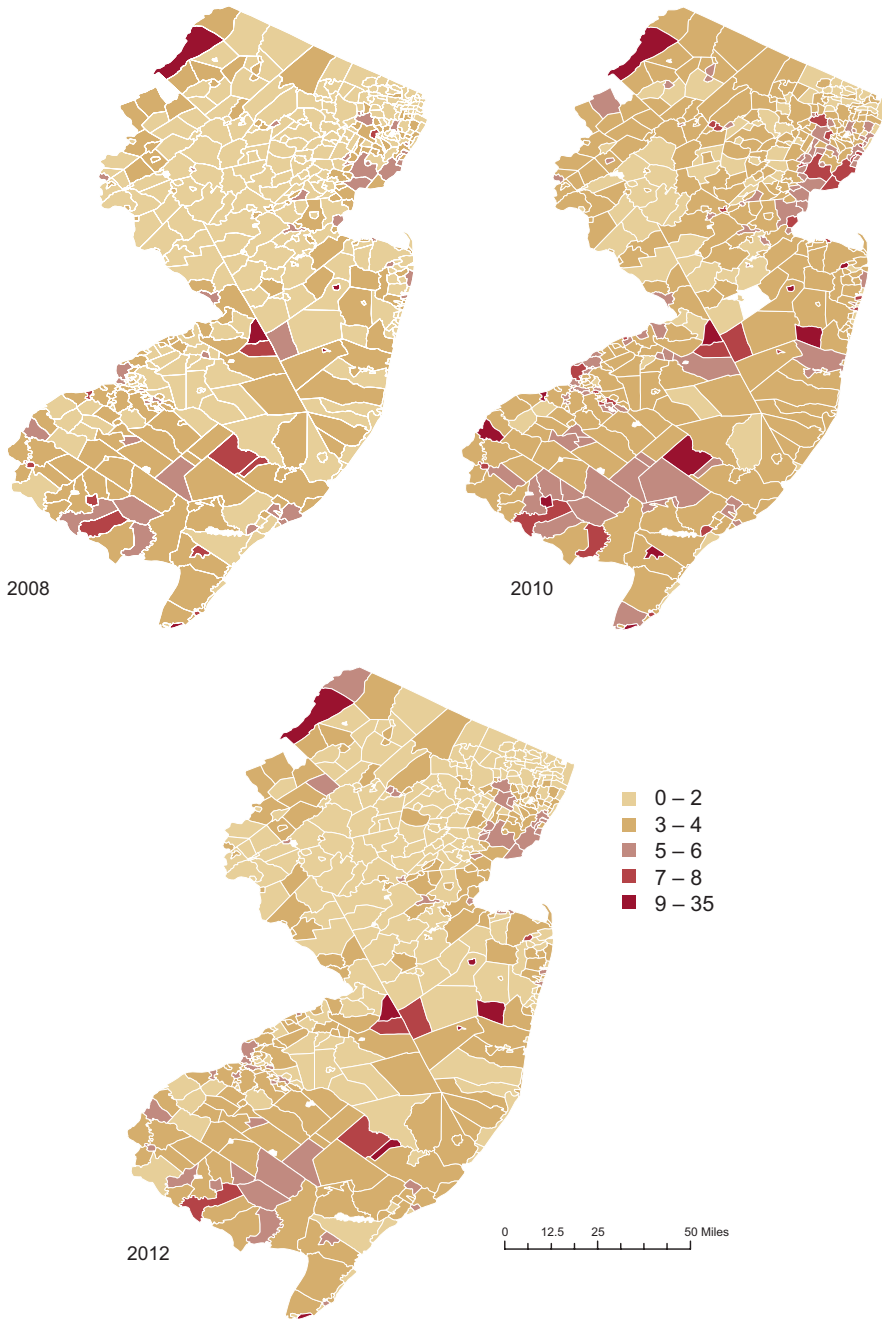
Trends in Expenditure Components



Source: Authors' calculations.

Notes: USD is U.S. dollars. School years correspond to the spring term. Dotted lines mark the immediate pre-recession school year (2007-08).

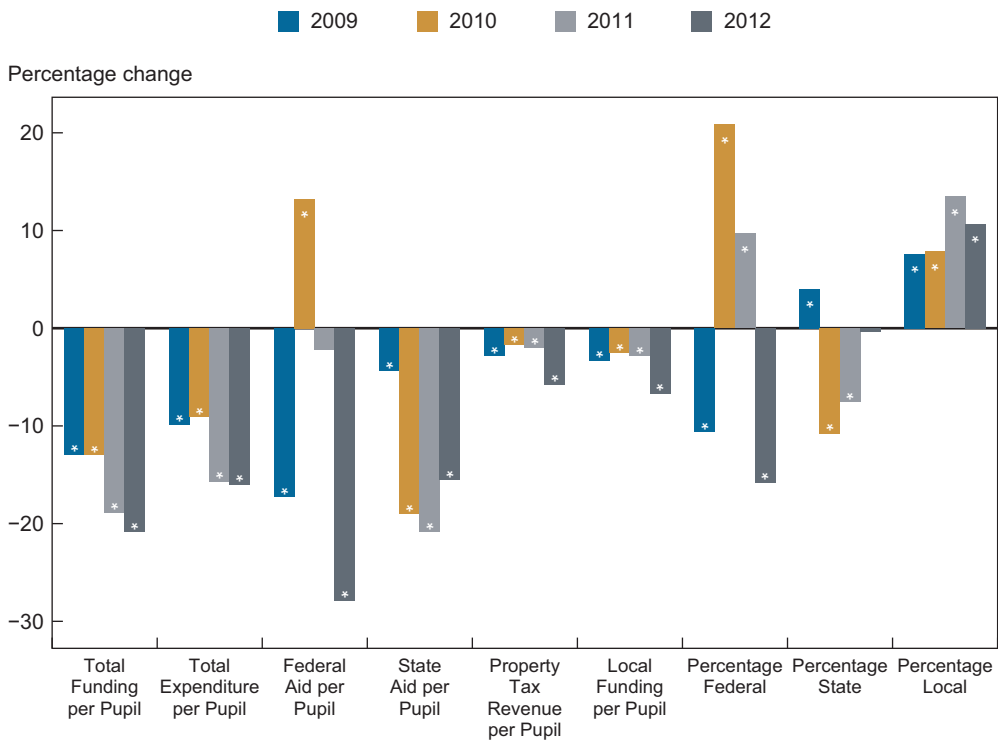
EXHIBIT 2  
Percentage of District Funding from Federal Aid



Source: Authors' calculations.

CHART 3

## Examining Patterns in Funding and Expenditures Using Shifts from the Pre-Recession Trend



Source: Authors' calculations.

Note: An asterisk (\*) indicates statistical significance at the 1 percent level.

In the 2010-11 school year, the state reduced aid to all districts by approximately 5 percent of the district's prior year general fund budget. In 2012, the state restored 2 percent of the funding, which explains the smaller magnitude of the negative shift in 2012 compared to that in 2011. Property taxes, the primary driver of local revenue, fell all four years, with local funding falling accordingly. Although these percentage shifts are smaller compared with the state and federal shifts, the base is much larger. Despite the fact that local funding fell significantly in every year, its share of total funding increased significantly because of the large fall in state aid.

What might be the mechanisms behind the substantive declines in funding per pupil seen above? The most important factor was the large decline in state funding per pupil, especially in the last three years considered, driven by declines in tax revenue as the economy was still weak. The influx of the stimulus money helped in stemming the cuts. As federal stimulus abated, funding per pupil saw even larger cuts.

It may be worth comparing some of these effects with the effects in other states or in the national data, as reported in the literature. Evans, Schwab, and Wagner (2019), using national data, finds a negative shift of state and local revenue by 5 percent three years after

the Great Recession started relative to the pre-recession period. Chakrabarti and Livingston (2019) finds that state aid per pupil and local aid per pupil in New York state fell, respectively, by 19.8 percent and 5.9 percent three years after the Great Recession. In contrast, we find respective declines of 15.5 percent and 6.7 percent in state aid and local aid per pupil relative to trend three years after the Great Recession in New Jersey. Turning to total funding and expenditure per pupil, Chakrabarti and Livingston (2019) finds negative shifts of, respectively, 9 percent and 6.8 percent relative to trend three years after the recession in New York. In contrast, in this article, we find markedly larger respective downward shifts of 20.8 percent and 16.0 percent for total funding and expenditure per pupil three years after the Great Recession. Markedly larger state funding cuts in New Jersey were likely responsible for considerably larger cuts in expenditures in that state relative to New York.

Regarding the components of expenditure, we find a general trend of reductions across the board. These results are presented in Table 2A and Chart 4. Almost all components experienced statistically significant cuts in 2009. The stimulus funding appears to have forestalled some of the reductions; we see fewer significant downward shifts in 2010, with only transportation and utilities being negatively affected. Transportation and utilities present as being the most affected categories: They have statistically significant negative shifts in all four years and experience the deepest cuts in each year. Instructional expenditure is the least affected, but it still had significant negative shifts in three of the four years we examine. The only year in which there is not a downward shift is 2010, the year of the stimulus. Thus, it appears that the stimulus prevented cuts in instructional expenditure. However, after the stimulus year, the gaps between instructional expenditure's pre-recession trend and its actual levels have grown over time. Instructional support and pupil services follow similar patterns, with a small, negative shift in the year immediately after the recession hit, no significant shift in the stimulus year, and then large, statistically significant negative shifts in 2011 and 2012. While all expenditure categories experienced large, negative, and statistically significant shifts in 2011 and 2012, these shifts were the smallest for instructional expenditure. These patterns indicate a compositional shift in favor of the instructional category, which districts appear to have prioritized over other categories.

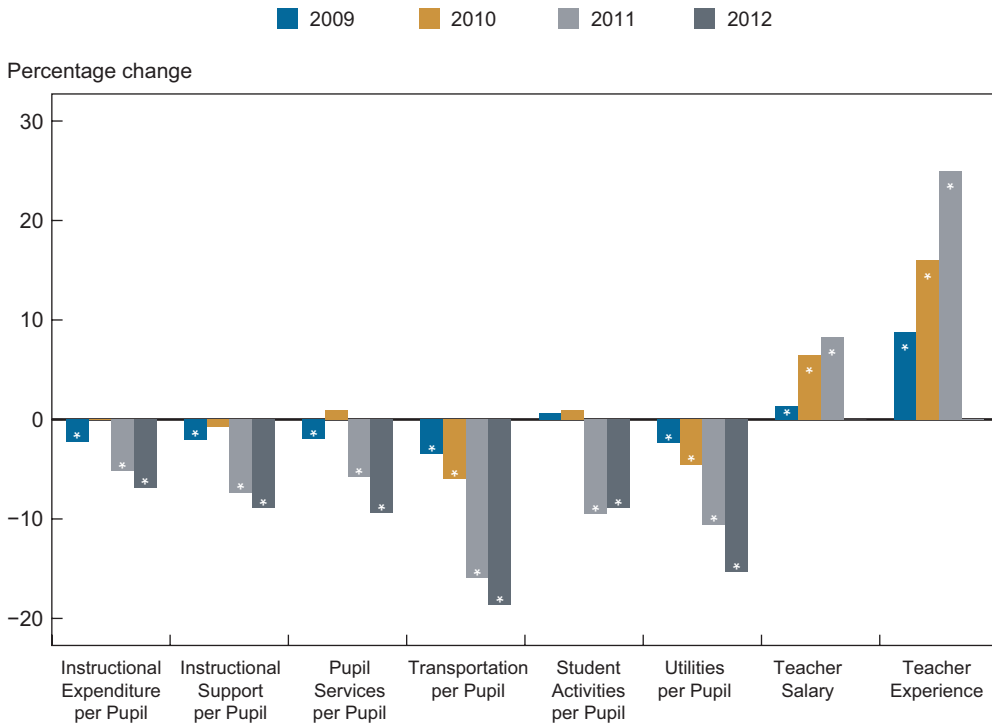
Looking at shifts in salaries and levels of experience, we see that teachers' salaries increased statistically and economically significantly relative to the pre-recession trend. Why might median salaries rise while everything else, including instructional expenditure, was cut? One potential answer lies in the tenure system. In New Jersey, public school teachers receive tenure in their third year of employment.<sup>10</sup> Under state education statutes, tenured teachers have firm job protections and cannot be laid off easily. Therefore, if districts are facing budget crises and need to let teachers go, they are more likely to lay off less experienced, lower-paid teachers. This hypothesis is supported by the large and statistically significant positive shifts in teacher experience that coincide with the increases in salary.

### 3.2 Heterogeneities by Metropolitan Area

In this section we analyze whether there were variations in how different metropolitan areas weathered the recession. The patterns for each metro area are obtained by aggregating the

CHART 4

## Examining Patterns in Expenditure Components Using Shifts from the Pre-Recession Trend



Source: Authors' calculations.

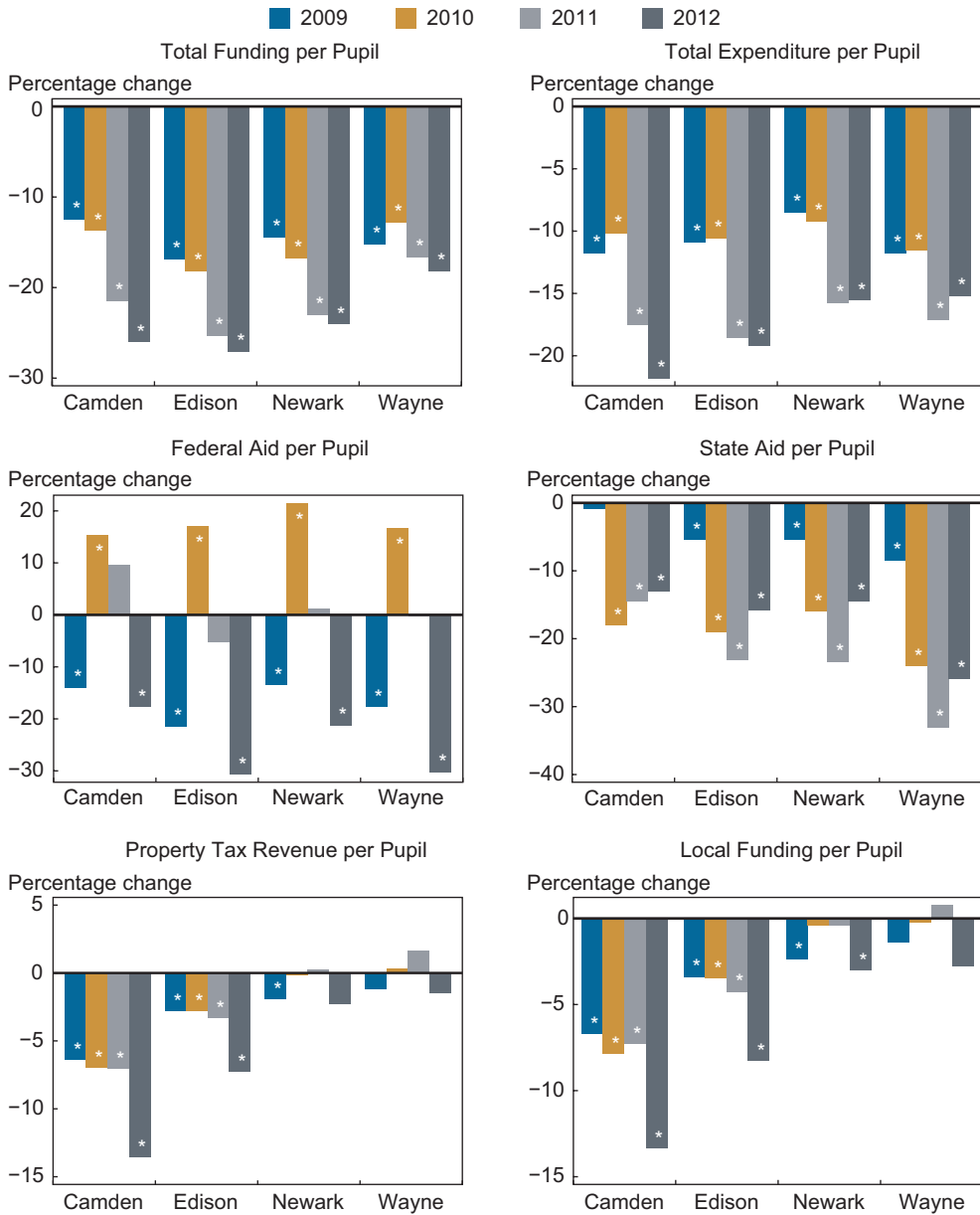
Note: An asterisk (\*) indicates statistical significance at the 1 percent level.

patterns of its component districts. Table 3A and Chart 5 show the heterogeneous effects across metro areas in total funding per pupil, total expenditure per pupil, and various components of total funding.<sup>11</sup> Focusing first on total funding per pupil, we find that all four metro areas that we consider—Camden, Edison, Newark, and Wayne—experienced significant negative shifts in funding in all four post-recession years. Camden, Edison, and Newark have a similar pattern of increasingly large negative shifts over time, of comparable magnitudes. Wayne is slightly different in that its 2010 negative shift is smaller in magnitude than its 2009 shift and its 2011 and 2012 shifts are much smaller than those of the other three metropolitan areas.

All metro areas saw negative shifts in expenditure per pupil in all four years. Newark had the smallest negative shifts relative to the other three, but all four metro areas experienced similar patterns: negative shifts of approximately 10 percent in the first two years, then jumping to larger negative shifts of 15 percent to 20 percent in the two later years.

CHART 5

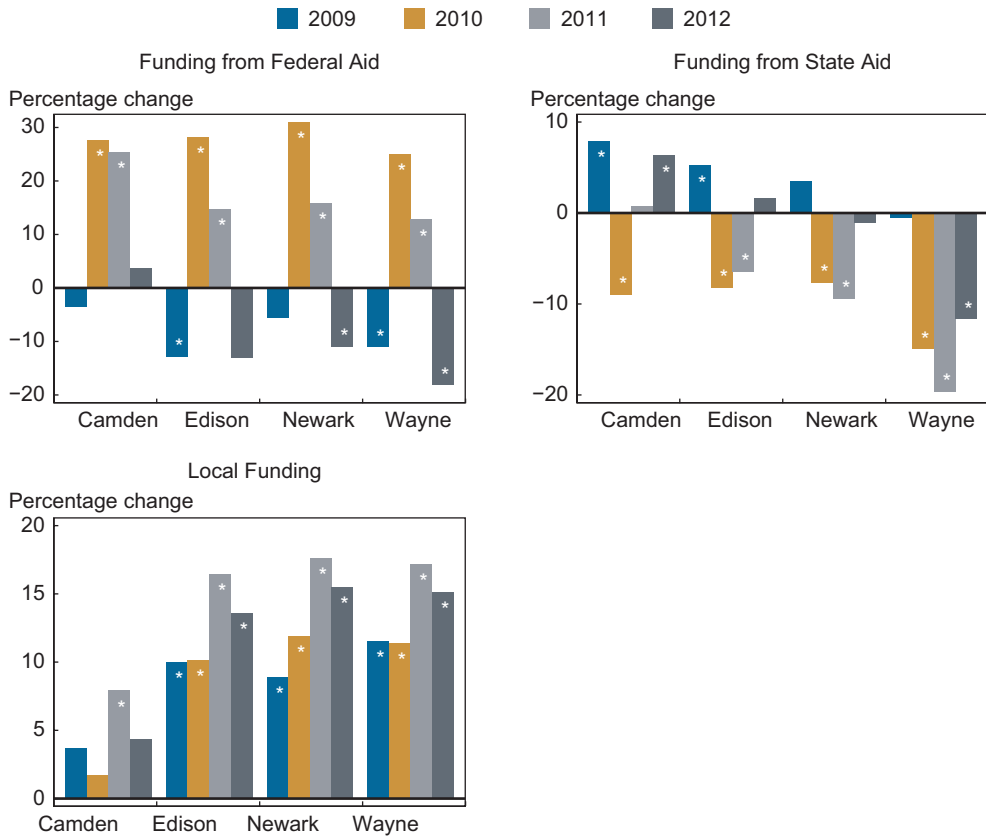
Examining Heterogeneities in Funding and Expenditure by Metropolitan Area Using Shifts from the Pre-Recession Trend



(CHART 5, CONTINUED ON P. 16)



CHART 5 (CONTINUED)



Source: Authors' calculations.

Notes: An asterisk (\*) indicates statistical significance at the 10 percent, 5 percent, or 1 percent level. For the exact level of statistical significance, please refer to Table 3A.

With respect to the components of funding, Newark saw the largest bump from the stimulus in 2010, with a 21 percent upward shift in federal aid. All four areas had statistically insignificant shifts in 2011 and significant negative shifts (both statistically and economically) in 2012. But Edison's and Wayne's 2012 downward shifts of more than 30 percent were much larger than Camden's and Newark's, which were around 20 percent.

Turning to patterns in state aid, Wayne had the largest decreases in state aid per pupil in each year. Camden saw an improvement in state aid per pupil from 2010 to 2011 and 2012, although even in 2012 it was still 13 percent below trend. The other three metro areas experienced the largest negative shift from trend in 2011, with some improvement in 2012, mirroring the overall trend in these metro areas.

There is a great deal of variation among the metro areas in property tax revenue per pupil and local funding per pupil. Camden, the highest poverty area among the metro areas we consider, saw the largest decreases in property tax revenue and local funding (a 13 percent downward shift in 2012), while Wayne did not experience any significant effects in any year.

Wayne is a relatively wealthy area, which may explain why it was able to preserve property tax revenue and local funding in the aftermath of a recession. Edison also saw large declines in property tax revenue per pupil and local funding per pupil, particularly in 2012, while Newark saw relatively small declines in 2009 and 2012, but not in 2010 or 2011. In all cases, local funding per pupil pretty closely tracks property tax revenue per pupil, as we would expect. Note that while local funding fell, the share of funding from local sources increased, which we interpret simply as local funding falling less than federal and state funding. With state funding per pupil exhibiting large negative shifts every year, the percentage of funding from federal aid shifted up in 2011, even though the actual amount had no statistically significant change from the pre-recession trend.

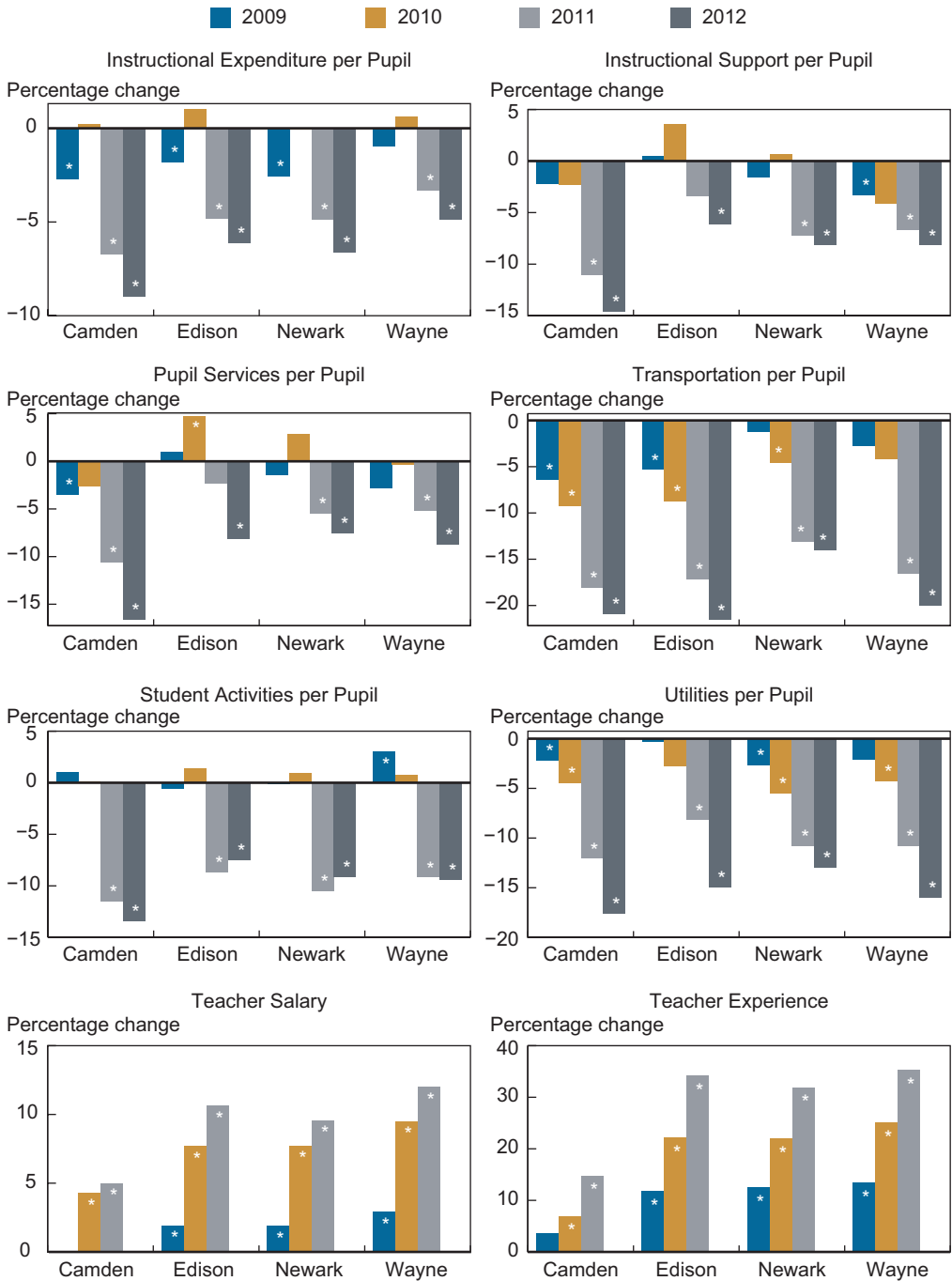
Next, we examine whether per pupil expenditures in the various component categories showed variations across the metro areas. The percentage shifts are presented in Table 4A and Chart 6, and the corresponding coefficient estimates in Table 6A. The analysis demonstrates that, although the magnitudes of the percentage shifts are different, the patterns over time are similar across metro areas in instructional expenditure, transportation, and utilities. Camden clearly experienced the harshest cuts to instructional expenditure, the category considered the most crucial component for student learning. Some metropolitan areas were actually able to increase spending in some categories in the stimulus year. Edison and Newark had statistically significant positive shifts in pupil services expenditures in 2010. Edison also had positive shifts in instruction, instructional support, and student activities, although these shifts were not statistically significant. However, after 2010, no metro area had positive shifts, and in 2012, every metro area had a statistically significant negative shift in every expenditure category.

Earlier in the article we discussed the surprising increase in median teacher salaries during the recession; this same pattern plays out in each of the metropolitan areas, with both salaries and experience increasing and significantly above trend. Camden is the outlier among the four metro areas here, with smaller increases in salary and experience: its shifts in 2011 are about half that of the other three metro areas (around 5 percent versus 10 percent for salary and 15 percent versus more than 30 percent for experience). It appears that Camden may just have taken a little more time to change its personnel policies; in 2013 Camden announced it would be laying off around 100 teachers.<sup>12</sup>

To summarize, school districts in the Camden and Edison metropolitan areas experienced greater negative impacts on both total funding and total expenditure from the recession than those in Newark and Wayne. Camden had, by far, the deepest cuts to instructional expenditure, the expenditure category that is most directly related to student learning. Additionally, Camden suffered markedly larger negative shifts in both 2011 and 2012 compared with the other metro areas in each of the noninstructional categories (instructional support, pupil services, transportation, student activities, and utilities). Although there is a fair amount of variation across the metro areas, they all were badly hit by the recession, as evidenced by the fact that in 2012 every one of them had statistically significant downward shifts (from the pre-recession trend) in all of their expenditure categories.

CHART 6

Examining Heterogeneities in Expenditure Components by Metropolitan Area Using Shifts from the Pre-Recession Trend



Source: Authors' calculations.

Notes: An asterisk (\*) indicates statistical significance at the 10 percent, 5 percent, or 1 percent level. For the exact level of statistical significance, please refer to Table 4A.

## 4. CONCLUSION

In this article we explored how New Jersey school finances were affected by the Great Recession, what role the stimulus played, and how schools fared when the stimulus waned. Using a rich panel data set on a variety of school finance indicators, we conducted a trend shift analysis to assess the school finance patterns in the aftermath of the economic downturn.

Our analysis uncovered some interesting findings. New Jersey school districts' funding and expenditure showed sharp reduction after the recession and did not recover in the four years after. Instead, the gaps between the pre-recession trend and the actual post-recession trend have grown over time. There were cuts even in the presence of the stimulus, but they deepened after the federal funds were depleted and the state and local economy had not yet recovered.

The examination of expenditure components showed that initially noninstructional categories were cut more to lessen the blow to instructional categories. However, as time wore on and the budgets were still tight, instructional spending fell significantly. Instructional spending recovered in 2010 with stimulus funding, but in 2011 and 2012, it fell sharply across the board.

By looking at districts' median teacher salaries and experience levels, we are able to see a pattern of growth in median teacher salaries and experience, suggesting that the districts resorted to laying off the less senior (or untenured) teachers. For instance, in the Bridgewater-Raritan Regional School District (in the Edison metro area), all 225 nontenured teachers received nonrenewal notices in 2010. Half of Newark's 942 nontenured teachers were laid off in 2010.<sup>13</sup>

Studying heterogeneity by metro areas, we find that while there was some variation in the first two years as to which expenditure categories were preserved, by 2012 all expenditure categories were down for all four metropolitan areas. The worst hit in terms of both instructional expenditure per pupil as well as each of the noninstructional expenditure categories was Camden, the highest poverty area among the metro areas we consider.

The findings of this article have important implications for the current recession fueled by the COVID-19 pandemic. The already visible deep cuts to state and local budgets have the potential to lead to adverse effects on school funding and expenditures. Our analysis suggests that while federal assistance to state and local governments may, to some extent, restrain the immediate adverse effects, the more damage would be expected to surface when this stimulus recedes. Even more concerning is that there may be a widening of inequalities in school funding and spending, with low-income areas potentially getting hit the hardest. One of the major reasons behind this is that (as evidenced here) low-income areas are less able to compensate for state funding cuts with substantial increases in property tax revenue and, correspondingly, local tax revenue. Not only are they not able to levy higher tax rates, but property tax bases in these districts are also lower, and both of these factors contribute to their lower ability to counter state budget cuts, a pattern seen following the Great Recession. These cuts to state funding and expenditures have the potential to harm not just the short-term educational outcomes but also the long-term outcomes of students, such as in their future labor market experiences (Jackson, Johnson, and Persico 2016). The effects on school finances overall and in components during and following the current recession, the corresponding impact on student outcomes, and the heterogeneity across school districts such as by relative wealth and income are critical questions for the future and remain important avenues for future research.

# APPENDIX

TABLE 1A  
Examining Patterns in Funding and Expenditure after the Recession

	Total Funding per Pupil	Total Expenditure per Pupil	Federal Aid per Pupil	State Aid per Pupil	Property Tax Revenue per Pupil	Local Funding per Pupil	Percentage Federal Aid	Percentage State Aid	Percentage Local Funding
Percentage shift in 2008-09	-12.93***	-9.87***	-17.54***	-4.37***	-2.83***	-3.33***	-10.79***	4.05***	7.61***
Percentage shift in 2009-10	-13.00***	-9.07***	13.07***	-19.03***	-1.72***	-2.55***	20.76***	-10.75***	7.84***
Percentage shift in 2010-11	-18.87***	-15.72***	-2.50	-20.89***	-1.99***	-2.84***	9.48***	-7.49***	13.50***
Percentage shift in 2011-12	-20.84***	-16.01***	-28.00***	-15.52***	-5.74***	-6.67***	-15.89***	-0.34	10.69***
Pre-recession base	\$24,596.06	\$21,156.82	\$592.16	\$6,520.96	\$11,630.43	\$12,097.10	2.41	27.81	51.32
Trend	726.29*** (65.48)	592.35*** (39.26)	16.49*** (3.23)	125.75*** (12.88)	344.20*** (19.59)	366.58*** (19.59)	0.02 (0.01)	-0.26*** (0.05)	0.12 (0.09)
2009	-3,179.28*** (336.38)	-2,089.20*** (166.00)	-103.87*** (15.77)	-285.02*** (40.68)	-329.61*** (42.51)	-403.10*** (46.72)	-0.26*** (0.05)	1.13*** (0.24)	3.91*** (0.49)
2010	-3,197.14*** (421.77)	-1,918.98*** (220.34)	77.39*** (13.01)	-1,241.08*** (67.70)	-200.15*** (66.32)	-308.74*** (71.93)	0.50*** (0.06)	-2.99*** (0.31)	4.02*** (0.63)
2011	-4,641.51*** (487.59)	-3,325.95*** (242.77)	-14.81 (17.36)	-1,361.93*** (71.20)	-231.07*** (88.27)	-343.98*** (88.52)	0.23*** (0.07)	-2.08*** (0.34)	6.93*** (0.72)
2012	-5,126.99*** (547.53)	-3,387.60*** (284.95)	-165.80*** (19.76)	-1,011.84*** (87.47)	-668.05*** (109.05)	-806.32*** (109.62)	-0.38*** (0.07)	-0.09 (0.39)	5.49*** (0.79)
Observations	7,881	7,881	7,881	7,881	7,581	7,881	7,889	7,889	7,889
R-squared	0.51	0.58	0.83	0.94	0.89	0.88	0.80	0.93	0.80

Source: Authors' calculations.

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

# APPENDIX (CONTINUED)

TABLE 2A  
Examining Patterns in Expenditure Components after the Recession

	Instructional Expenditure per Pupil	Instructional Support per Pupil	Student Services per Pupil	Transportation per Pupil	Student Activities per Pupil	Utilities per Pupil	Teacher Salary	Teacher Experience
Percentage shift in 2008-09	-2.24***	-2.11***	-2.02***	-3.62***	0.68	-2.42***	1.31***	8.85***
Percentage shift in 2009-10	0.04	-0.78	0.95	-6.05***	1.00	-4.56***	6.46***	15.98***
Percentage shift in 2010-11	-5.23***	-7.45***	-5.92***	-16.13***	-9.53***	-10.60***	8.32***	25.01***
Percentage shift in 2011-12	-6.85***	-8.94***	-9.45***	-18.74***	-8.87***	-15.34***		
Pre-recession base	\$8,164.03	\$2,001.50	\$1,675.93	\$800.25	\$249.31	\$1,693.66	\$60,385.91	10.13
Trend	173.16*** (10.62)	71.41*** (4.24)	61.79*** (3.39)	18.28*** (2.23)	5.34*** (0.57)	51.83*** (3.05)	-420.88*** (74.75)	-0.42*** (0.04)
2009	-182.67*** (30.43)	-42.30*** (14.08)	-33.79*** (11.78)	-28.98*** (7.55)	1.70 (1.75)	-41.01*** (10.02)	791.11*** (199.61)	0.90*** (0.09)
2010	2.91 (42.83)	-15.68 (25.85)	15.99 (18.63)	-48.44*** (10.39)	2.49 (2.59)	-77.26*** (12.99)	3,902.20*** (276.25)	1.62*** (0.12)
2011	-426.68*** (52.53)	-149.05*** (25.58)	-99.16*** (19.71)	-129.11*** (12.52)	-23.76*** (3.66)	-179.48*** (17.21)	5,023.81*** (350.66)	2.53*** (0.15)
2012	-558.96*** (64.13)	-178.84*** (31.05)	-158.35*** (24.06)	-149.99*** (14.59)	-22.12*** (4.40)	-259.87*** (22.05)		
Observations	7,880	7,880	7,880	7,872	7,813	7,880	6,179	6,179
R-squared	0.64	0.71	0.74	0.82	0.96	0.72	0.81	0.69

Source: Authors' calculations.

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

# APPENDIX (CONTINUED)

TABLE 3A  
Examining Heterogeneities in Funding and Expenditure by Metropolitan Area

	Total Funding per Pupil				Total Expenditure per Pupil			
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	-12.49***	-16.71***	-14.50***	-15.25***	-11.76***	-10.78***	8.50***	-11.83***
Percentage shift in 2009-10	-13.72***	-18.02***	-16.82***	-12.88***	-10.15***	-10.46***	-9.23***	-11.63***
Percentage shift in 2010-11	-21.46***	-24.92***	-22.99***	-16.71***	-17.53***	-18.32***	-15.78***	-17.17***
Percentage shift in 2011-12	-26.05***	-26.71***	-24.00***	-18.20***	-21.77***	-18.96***	-15.54***	-15.25***
Pre-recession base	\$24,371.49	\$25,458.89	\$24,292.09	\$23,589.23	\$20,053.61	\$21,661.14	\$21,149.56	\$21,153.69
R-squared	0.52	0.39	0.49	0.63	0.56	0.42	0.61	0.77

	Federal Aid per Pupil				State Aid per Pupil			
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	-14.38**	-20.87***	-13.77***	-19.70***	-0.89	-5.29***	-5.41***	-8.46***
Percentage shift in 2009-10	14.97***	17.64***	21.21***	14.58***	-18.11***	-18.86***	-16.01***	-24.09***
Percentage shift in 2010-11	8.74	-3.70	0.98	-2.52	-14.56***	-22.79***	-23.42***	-33.06***
Percentage shift in 2011-12	-18.60**	-29.29***	-21.17***	-31.96***	-13.23***	-15.42***	-14.45***	-25.91***
Pre-recession base	\$725.83	\$519.19	\$460.57	\$534.88	\$8,537.93	\$5,858.69	\$5,323.06	\$4,934.68
R-squared	0.85	0.72	0.87	0.83	0.92	0.88	0.96	0.97

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# APPENDIX (CONTINUED)

TABLE 3A (CONTINUED)

	Property Tax Revenue per Pupil				Local Funding per Pupil			
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	-6.41***	-2.79***	-1.94***	-1.11	-6.76***	-3.39***	-2.41***	-1.39
Percentage shift in 2009-10	-6.98***	-2.80**	-0.17	0.46	-7.89***	-3.46**	-0.46	-0.22
Percentage shift in 2010-11	-7.14***	-3.32**	0.24	1.77	-7.36***	-4.22**	-0.45	0.79
Percentage shift in 2011-12	-13.64***	-7.30***	-2.32	-1.42	-13.44***	-8.24***	-3.00*	-2.76
Pre-recession base	\$8,785.14	\$12,396.63	\$12,654.34	\$13,295.00	\$9,274.59	\$13,125.60	\$13,016.14	\$13,843.99
R-squared	0.92	0.71	0.93	0.96	0.92	0.69	0.91	0.94

	Percentage Federal Aid				Percentage State Funding			
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	-3.85	-12.81**	-5.76	-12.07***	7.94***	5.12***	3.48	-0.48
Percentage shift in 2009-10	27.16***	28.22***	30.84***	23.86***	-8.94***	-8.22***	-7.58***	-14.87***
Percentage shift in 2010-11	24.39***	14.78**	15.73***	11.62**	0.82	-6.62**	-9.35***	-19.59***
Percentage shift in 2011-12	2.46	-13.03	-10.83**	-19.02***	6.41*	1.48	-1.02	-11.61***
Pre-recession base	2.77	2.15	1.97	2.23	36.79	24.22	23.14	21.45
R-squared	0.74	0.79	0.83	0.85	0.83	0.94	0.94	0.96

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# APPENDIX (CONTINUED)

TABLE 3A (CONTINUED)

Panel E	Percentage Local Funding			
	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	3.64	10.01***	8.95***	11.58***
Percentage shift in 2009-10	1.66	10.12***	11.94***	11.43***
Percentage shift in 2010-11	7.82**	16.38***	17.64***	17.26***
Percentage shift in 2011-12	4.26	13.52***	15.48***	15.19***
Pre-recession base	42.05	54.03	56.16	60.04
R-squared	0.78	0.74	0.71	0.77
Observations	1,460	1,667	1,878	1,474

Source: Authors' calculations.

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

# APPENDIX (CONTINUED)

TABLE 4A  
Examining Heterogeneities in Expenditure Components by Metropolitan Area

	Instructional Expenditure per Pupil				Instructional Support per Pupil			
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	-2.69***	-1.78*	-2.65***	-0.96	-2.37	0.64	-1.75	-3.47**
Percentage shift in 2009-10	0.26	1.03	-0.11	0.63	-2.43	3.66	0.57	-4.26
Percentage shift in 2010-11	-6.66***	-4.78**	-4.91***	-3.35**	-11.28***	-3.05	-7.34***	-6.82***
Percentage shift in 2011-12	-8.87***	-6.06***	-6.61***	-4.87***	-14.84***	-5.88*	-8.16***	-8.32**
Pre-recession base	\$7,667.96	\$8,159.60	\$8,359.95	\$8,242.63	\$1,842.25	\$1,958.49	\$2,094.71	\$2,129.16
Observations	1,457	1,666	1,875	1,473	1,457	1,666	1,875	1,473
R-squared	0.78	0.38	0.75	0.83	0.75	0.54	0.76	0.80
					Transportation per Pupil			
					Pupil Services per Pupil			
Percentage shift in 2008-09	-3.54**	1.05	-1.50	-3.05*	-6.47***	-5.34***	-1.30	-3.41
Percentage shift in 2009-10	-2.68	4.83*	2.80*	-0.63	-9.31***	-8.78***	-4.60*	-4.89
Percentage shift in 2010-11	-10.81***	-2.16	-5.53**	-5.38**	-18.14***	-17.19***	-13.07***	-17.30***
Percentage shift in 2011-12	-16.84***	-8.01**	-7.50**	-8.93**	-21.04***	-21.59***	-14.06***	-20.54***
Pre-recession base	\$1,534.39	\$1,670.95	\$1,774.23	\$1,756.88	\$760.72	\$850.61	\$862.00	\$641.93
Observations	1,457	1,666	1,875	1,473	1,457	1,666	1,867	1,473
R-squared	0.77	0.60	0.77	0.83	0.88	0.78	0.91	0.72

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# APPENDIX (CONTINUED)

TABLE 4A (CONTINUED)

	Student Activities per Pupil			Utilities per Pupil				
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Percentage shift in 2008-09	1.04	-0.72	-0.10	3.04**	-2.19*	-0.33	-2.76***	-2.12
Percentage shift in 2009-10	0.15	1.28	1.00	0.82	-4.45***	-2.80	-5.63***	-4.25***
Percentage shift in 2010-11	-11.54***	-9.14***	-10.49***	-9.16***	-12.09***	-8.23***	-10.86***	-10.83***
Percentage shift in 2011-12	-13.41***	-7.90**	-9.13**	-9.43***	-17.63***	-14.99***	-12.97***	-15.96***
Pre-recession base	\$233.76	\$264.86	\$276.36	\$282.27	\$1,614.45	\$1,739.01	\$1,693.95	\$1,693.82
Observations	1,434	1,654	1,865	1,472	1,457	1,666	1,875	1,473
R-squared	0.96	0.94	0.96	0.97	0.83	0.50	0.80	0.88
					Teacher Experience			
Percentage shift in 2008-09	0.02	1.88**	1.85***	2.86***	3.64	11.74***	12.46***	13.63***
Percentage shift in 2009-10	4.27***	7.65***	7.71***	9.47***	6.94**	22.13***	21.88***	25.20***
Percentage shift in 2010-11	5.03***	10.43***	9.54***	11.98***	14.86***	34.12***	31.80***	35.32***
Pre-recession base	\$58,855.78	\$58,082.16	\$61,343.26	\$63,457.26	11.05	9.34	9.59	9.15
Observations	1,145	1,302	1,470	1,154	1,145	1,302	1,470	1,154
R-squared	0.79	0.77	0.81	0.80	0.69	0.67	0.68	0.66

Source: Authors' calculations.

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

# APPENDIX (CONTINUED)

TABLE 5A  
Coefficient Estimates for Trend Shifts in Funding and Expenditure by Metropolitan Area

	Total Funding per Pupil				Total Expenditure per Pupil			
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
2009	-3,043.85*** (886.24)	-4,255.04*** (692.47)	-3,522.63*** (716.31)	-3,598.32*** (792.16)	-2,358.62*** (425.35)	-2,335.47*** (363.68)	-1,797.11*** (352.17)	-2,502.46*** (342.45)
2010	-3,344.75*** (941.06)	-4,587.12*** (966.10)	-4,086.32*** (856.99)	-3,037.93*** (1019.31)	-2,035.61*** (590.96)	-2,265.51*** (506.68)	-1,952.28*** (380.51)	-2,460.55*** (411.39)
2011	-5,230.69*** (1,152.55)	-6,345.41*** (1,096.13)	-5,585.48*** (1,002.25)	-3,942.32*** (1,297.94)	-3,514.61*** (568.62)	-3,969.14*** (526.42)	-3,337.27*** (485.82)	-3,631.46*** (476.09)
2012	-6,349.69*** (1,496.83)	-6,799.64*** (1,236.46)	-5,830.61*** (1,149.87)	-4,293.97*** (1,351.85)	-4,365.55*** (718.06)	-4,106.65*** (626.21)	-3,286.46*** (538.52)	-3,226.77*** (642.95)
Observations	1,457	1,666	1,876	1,473	1,457	1,666	1,876	1,473
	Federal Aid per Pupil				State Aid per Pupil			
2009	-104.38** (49.77)	-108.37*** (24.41)	-63.42*** (13.65)	-105.36*** (17.78)	-75.79 (102.53)	-310.05*** (72.43)	-288.19*** (65.69)	-417.63*** (85.15)
2010	108.69*** (29.99)	91.58*** (23.57)	97.67*** (20.83)	77.98*** (25.67)	-1,546.42*** (192.61)	-1,104.75*** (109.63)	-852.00*** (103.25)	-1,188.80*** (159.29)
2011	63.46 (62.98)	-19.20 (28.50)	4.49 (17.84)	-13.49 (34.79)	-1,242.79*** (250.62)	-1,335.41*** (116.98)	-1,246.77*** (112.66)	-1,631.21*** (139.44)
2012	-135.00** (52.23)	-152.07*** (40.37)	-97.50*** (19.24)	-170.96*** (37.65)	-1,129.72*** (334.42)	-903.69*** (171.79)	-769.06*** (130.60)	-1,278.38*** (161.91)
Observations	1,457	1,666	1,876	1,473	1,457	1,666	1,876	1,473

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# APPENDIX (CONTINUED)

TABLE 5A (CONTINUED)

	Percentage Local Funding			
	Camden	Edison	Newark	Wayne
2009	1.53 (0.97)	5.41*** (0.92)	5.03*** (1.11)	6.95*** (1.41)
2010	0.70 (1.33)	5.47*** (1.26)	6.71*** (1.36)	6.86*** (1.79)
2011	3.29** (1.42)	8.85*** (1.41)	9.91*** (1.60)	10.36*** (2.02)
2012	1.79 (1.60)	7.30*** (1.62)	8.70*** (1.82)	9.12*** (2.17)
Observations	1,460	1,667	1,878	1,474

Source: Authors' calculations.

Notes: The table presents coefficients from our regressions using specification (1). \*, \*\*, \*\*\* 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 percentage of students eligible for free or reduced-price lunch.



# APPENDIX (CONTINUED)

TABLE 6A (CONTINUED)

	Student Activities per Pupil			Utilities per Pupil				
	Camden	Edison	Newark	Wayne	Camden	Edison	Newark	Wayne
Trend	5.05*** (1.20)	6.83*** (1.49)	5.07*** (1.29)	4.75*** (1.27)	51.39*** (7.83)	59.76*** (6.22)	45.81*** (4.96)	33.51*** (5.56)
2009	2.42 (3.82)	-1.90 (4.30)	-0.27 (3.70)	8.57** (3.56)	-35.31* (18.04)	-5.75 (21.43)	-46.83*** (17.70)	-35.84 (23.77)
2010	0.36 (4.49)	3.38 (6.33)	2.76 (6.61)	2.31 (4.58)	-71.85*** (23.02)	-48.65 (31.86)	-95.37*** (20.05)	-71.98*** (27.10)
2011	-26.98*** (6.37)	-24.19*** (8.46)	-28.99*** (9.99)	-25.86*** (8.16)	-195.23*** (30.15)	-143.19*** (46.73)	-183.96*** (24.93)	-183.39*** (36.15)
2012	-31.35*** (7.19)	-20.93** (10.35)	-25.22** (12.00)	-26.63*** (9.78)	-284.69*** (42.22)	-260.60*** (67.23)	-219.77*** (31.48)	-270.40*** (40.57)
Observations	1,434	1,654	1,865	1,472	1,457	1,666	1,875	1,473
R-squared	0.96	0.94	0.96	0.97	0.83	0.50	0.80	0.88
	Teacher Salary			Teacher Experience				
Trend	-116.06 (130.41)	-495.24*** (156.40)	-645.74*** (134.65)	-1,116.73*** (179.90)	-0.32*** (0.08)	-0.48*** (0.07)	-0.49*** (0.06)	-0.70*** (0.10)
2009	10.98 (497.66)	1,089.62** (446.93)	1,137.13*** (378.43)	1,817.83*** (479.36)	0.40 (0.24)	1.10*** (0.21)	1.19*** (0.16)	1.25*** (0.15)
2010	2,514.41*** (635.98)	4,443.10*** (587.74)	4,727.27*** (434.74)	6,008.44*** (741.92)	0.77** (0.34)	2.07*** (0.24)	2.10*** (0.22)	2.31*** (0.23)
2011	2,961.68*** (788.80)	6,058.15*** (756.60)	5,850.86*** (634.89)	7,600.32*** (884.78)	1.64*** (0.44)	3.19*** (0.30)	3.05*** (0.27)	3.23*** (0.29)
Observations	1,145	1,302	1,470	1,154	1,145	1,302	1,470	1,154
R-squared	0.79	0.77	0.81	0.80	0.69	0.67	0.68	0.66

Source: Authors' calculations.

Notes: The table presents coefficients from our regressions using specification (1). \*, \*\*, \*\*\* 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 percentage of students eligible for free or reduced-price lunch.



## NOTES

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<sup>1</sup> See, for example, Duncombe and Yinger (2000, 2011), Rubenstein et al. (2007), Baker (2009), Stiefel and Schwartz (2011), among others.

<sup>2</sup> Dye and Reschovsky (2008); Chakrabarti and Sutherland (2013a, 2013b); Chakrabarti, Livingston, and Roy (2014); Chakrabarti, Livingston, and Setren (2015); Bhalla, Chakrabarti and Livingston (2017); Chakrabarti and Livingston (2019); Evans, Schwab, and Wagner (2019).

<sup>3</sup> Dye and Reschovsky (2008); Chakrabarti, Livingston, and Roy (2014).

<sup>4</sup> Chakrabarti and Sutherland (2013b); Chakrabarti, Livingston, and Setren (2015); Bhalla, Chakrabarti and Livingston (2017); Chakrabarti and Livingston (2019); and Evans, Schwab, and Wagner (2019).

<sup>5</sup> Chakrabarti and Sutherland (2013a, 2013b); Bhalla, Chakrabarti, and Livingston (2017).

<sup>6</sup> Bhalla, Chakrabarti, and Livingston (2017) compares the experiences of New York and New Jersey schools following the Great Recession in the short term, as captured by differences in effects on school finances. They find that the experience of New Jersey schools was quite different from that of New York schools. Schools in New Jersey not only sustained sizable cuts in total funding and total expenditure per pupil in the short term following the recession but also faced sizable cuts in instructional expenditure per pupil in the short term. In contrast, total funding and expenditures per pupil were maintained on trend in New York as was the trend in instructional spending.

<sup>7</sup> See <https://www.state.nj.us/education/stateaid/1011/CommissionersMemo2011.pdf>.

<sup>8</sup> Throughout the article, we refer to school years using the year corresponding to the spring semester.

<sup>9</sup> All calculated district medians are reported in October of each school year; the years of experience variables are based on the total number of years in public education.

<sup>10</sup> This was recently changed to the fourth year, but that change occurs after our period of observation and is unlikely to change the general pattern we observe here.

<sup>11</sup> The corresponding coefficient estimates are presented in Table 5A.

<sup>12</sup> See [https://www.nj.com/camden/index.ssf/2013/05/camden\\_schools\\_to\\_layoff\\_more.html](https://www.nj.com/camden/index.ssf/2013/05/camden_schools_to_layoff_more.html).

<sup>13</sup> See [https://www.nj.com/news/index.ssf/2010/05/hundreds\\_of\\_pink\\_slips\\_to\\_be\\_s.html](https://www.nj.com/news/index.ssf/2010/05/hundreds_of_pink_slips_to_be_s.html).

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