

Precarious Slopes? The Great Recession, Federal Stimulus, and New Jersey Schools

Working Paper #02-12
March 2012

Rajashri Chakrabarti
Federal Reserve Bank of New York

Sarah Sutherland
Federal Reserve Bank of New York

Corresponding Author: Federal Reserve Bank of New York, 33 Liberty Street, New York, NY10045. Email: Rajashri.Chakrabarti@ny.frb.org. The authors would like to thank Jason Bram, Erica Groshen, Andrew Haughwout, James Orr, Amy Ellen Schwartz, Giorgio Topa, and seminar participants at the Federal Reserve Bank of New York and the NYU-FRBNY Fiscal Breakfast for their valuable insight and feedback. We are grateful to Kevin Dehmer, Susan Ecks, Frank Lavdas, and the New Jersey Department of Education for patiently answering numerous questions and providing generous help in acquiring the data. We would also like to thank staff at the US Census Bureau, the US Department of Education, and the New Jersey School Boards Association for answering many questions and providing assistance with different parts of the data. Elizabeth Setren provided excellent research assistance. All errors are our own.

Editorial Board

The editorial board of the IESP working paper series is comprised of senior research staff and affiliated faculty members from NYU's Steinhardt School of Culture, Education, and Human Development and Robert F. Wagner School of Public Service. The following individuals currently serve on our Editorial Board:

Amy Ellen Schwartz

Director, IESP
NYU Steinhardt and NYU Wagner

Sean Corcoran

NYU Steinhardt

Cynthia Miller-Idriss

NYU Steinhardt

Leslie Santee Siskin

NYU Steinhardt

Leanna Stiefel

Associate Director for Education Finance, IESP
NYU Wagner and NYU Steinhardt

Beth Weitzman

NYU Steinhardt

ABSTRACT

While sparse literature exists investigating the impact of the Great Recession on various sectors of the economy, there is virtually no research that studies the effect of the Great Recession, or past recessions, on schools. This paper starts to fill the void. Studying school funding during the recession is of paramount importance because schools have a fundamental role in fostering human capital formation and economic growth. We exploit unique panel data and trend shift analysis to analyze how New Jersey school finances were affected during the Great Recession and the ARRA federal stimulus period. Our results show strong evidence of downward shifts in both revenue and expenditure following the recession. Federal stimulus seemed to have helped in 2010, however both revenue and expenditure still declined. While total revenue declined, the various components of revenue did not witness symmetric changes. The infusion of funds with the federal stimulus occurred simultaneously with statistically and economically significant cuts in state and local financing, especially the former. Our results also show a compositional shift in expenditures in favor of categories that are linked most closely to instruction, while several non-instruction categories including transportation and utilities declined. Interestingly, budgetary stress seems to have led to significant lay-offs for untenured teachers, leading to a rightward shift of the teacher salary and experience distributions. Heterogeneity analysis shows that high poverty and urban districts sustained the largest falls in the post-recession era, with Abbott districts specifically falling the furthest from pre-recession trends. Of importance, the Abbott districts were the only group in our expansive analysis to show statistically significant negative shifts in instructional expenditure even with the federal stimulus. The findings of this paper contribute valuable insight regarding schools' financial situations during recession and can serve as a guide to aid future policy decisions.

Key Words: School finance, Recession, ARRA, Federal Stimulus, Abbott Districts

JEL Classifications: H4, I21, I28

“The Legislature shall provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all the children in the State between the ages of five and eighteen years.”

- New Jersey State Constitution: Article V, Section IV

“WHEREAS, the New Jersey State Constitution requires the Governor to take care that the laws of this State be faithfully executed, N.J.Const. (1947) Article V, Section 1, Paragraph 11, including ensuring compliance with the constitutional mandate that a balanced State budget be maintained, N.J.Const. (1947) Article VIII, Section 2, Paragraph 2”

-Executive Order No. 14, signed by Governor Chris Christie, February 11, 2011

1 INTRODUCTION

The relevance of the investment in the education of children to human capital formation and economic growth is well established in economic research.⁴ Surprisingly then, one important component of this topic has been vastly overlooked in the literature: the impact of recessions on education.

The Great Recession was marked by a downturn in housing prices, employment, and business activity, each of which contributed to smaller tax revenues and larger budget gaps.⁵ These budget gaps had a deleterious effect on state and local governments' ability to fully fund schools. While a sparse literature investigates the impact of the Great Recession on other sectors of the economy, there is virtually no research so far that seeks to study the effects of the Great Recession, or past recessions, on schools. Our paper starts to fill this void.

This paper examines how school finances in New Jersey were affected by the onset of the Great Recession and the federal stimulus funding period that followed. Understanding how the Great Recession affected schools has long term societal and policy implications. Using unique panel data on a multitude of school finance variables, we apply a trend shift analysis to analyze the above questions.

Demonstrating national concern for the safeguarding of student achievement during a recession marked by pervasive budget cuts, the federal government designated the largest portion of its stimulus package grant funding to public education. In February 2009, Congress passed the American Recovery and Reinvestment Act (ARRA), an economic stimulus package that provided an anticipated \$840 billion in new spending, with \$100 billion designated for public education. Of this \$100 billion, New Jersey appropriated \$2.23 billion.⁶

Studying New Jersey is instructive for various reasons. For one, New Jersey is one of the highest spending states in the nation in terms of total education expenditure per pupil. Additionally, the state's unique history has made it the paramount example in any analysis of the disparity between poor, urban districts, and their wealthy counterparts. In an unprecedented ruling, the 1997 *Abbott v. Burke* litigation ordered a significant increase in funding for the 30 (now 31) high poverty, urban districts known as the Abbott districts, while the remaining New Jersey districts were subject to a different funding formula. This ruling, as well many others, makes New Jersey a natural forum to explore school finances at the district level.

In addition to studying the overall impact of the recession, we also study if the effects varied by poverty (including Abbott status), metropolitan area, and urban status. Studying this variation allows us to explore the interaction of the Great Recession with historic legal designations and presiding public opinion regarding differential treatment across district lines.

The analysis yields some interesting results. There is strong evidence of downward shift in both revenue and expenditure following the recession in New Jersey. Federal stimulus seemed to

⁴ Barro (1991), Benhabib and Spiegel (1994), Becker (1994), and Hanushek and Woessmann (2007).

⁵ See Gerst and Wilson (2010) and Deitz, et al (2010) for an analysis of the budgets gaps nationally and in New Jersey respectively.

⁶ This number came from a document provided by the State of New Jersey Department of Treasury, Office of Management and Budget and represents the total ARRA appropriation for New Jersey.

have helped in 2010—while both variables still exhibit declines, they are somewhat smaller than that in 2009.⁷

While total revenue declined, the various components of revenue did not witness symmetric changes, rather there were some interesting compositional shifts. State aid per pupil declined in both years after the recession, as did local revenue per pupil. But the percentage decline in state aid per pupil far exceeded the corresponding decline in local revenue per pupil, especially in the second year after recession. In contrast, there was an upward shift in federal aid per pupil in 2010 following the introduction of the ARRA funds. Without the support of the federal stimulus in 2010, total aid to districts would have declined even further, given other components. As a result of these changes, reliance on federal aid increased in 2010, while reliance on state aid declined.

Next, we delve deeper to investigate how the different components of expenditures were affected. While instructional expenditure per pupil declined in 2009, there is no evidence of any decline in 2010. This indicates that the federal stimulus funding may have been successful in preventing declines in instructional expenditure. This category includes teacher salaries and classroom expenditure and constitutes the spending category that most directly interacts with student learning.

The patterns in instructional support per pupil and student services per pupil show patterns similar to instructional expenditure. In contrast, other non-instructional categories such as transportation and utilities show declines in both years. Median teacher salaries show a positive shift in both years after the recession, while median teacher experience also increased. These teacher patterns are consistent with an increase in lay-offs of less-experienced teachers, which would intuitively shift the teacher salary distribution to the right.

Despite these overall statewide patterns, there was considerable heterogeneity by poverty, metropolitan area, and urban status. High poverty districts sustained larger falls in nearly all expenditure categories as compared to their medium poverty and affluent counterparts. Within the high poverty districts, the Abbott districts suffered the largest falls. The most disparate example in our analysis is the finding that Abbott districts were the only group in the entire set of heterogeneity categories that failed to return instructional expenditure at least to pre-recession trend levels. While evidence shows the rest of the state shifting spending toward instruction and away from non-instruction categories, the Abbott districts' revenues declined enough that no spending category was preserved.

Studying variations by metropolitan areas, we find that Edison fared best both in terms of instructional expenditure as well as most of the non-instructional expenditure categories. Studying variations by urban status reveals that rural districts fared best across most categories, while urban districts experienced the largest declines.

This paper builds on the existing literature relating to school funding in general [Baker (2009), Bedard and Brown (2000), Betts (1995), Feldstein (1978), Gordon (2004), Rubenstein et al.

⁷ In this paper, we refer to school years by the year corresponding to the spring semester.

(2007, and Stiefel and Schwartz (2011)], and the literature on New Jersey School finance and Abbott funding in particular [Resch (2008 and Firestone, et al (1994, 1997)]. While these papers study general school funding patterns, ours is the first study to examine whether recession affects school finance patterns, and also whether federal stimulus funding can make a difference.

It is worth noting here that we view our findings as strongly suggestive, but not necessarily causal. This is because we implement a trend shift analysis—theoretically if there were common shocks in the two years following recession that had the capability to affect our financial variables, these shocks would bias our estimates. We do an exhaustive analysis of potential confounding factors during this period that might bias our results (see section 4.1 and 5.6). This analysis helps us interpret the results, frame our perspective, and put bounds on the recession impact estimates.

Moreover, the Great Recession was not a marginal shock; rather it was a highly discontinuous shock. Therefore, even if there were other small shocks during these two years, they would be dwarfed by a shock as large as the Great Recession, adding further confidence to our results. Studying school funding during this difficult time period is of paramount importance because schools have a fundamental role in educating children and fostering human capital formation and growth. Any adverse effect on schools and student learning can have potentially deleterious effects on human capital formation, and by extension, our nation's future. Our paper provides valuable insight about how school districts fared during the financial downturn and promises to both improve our understanding of schools' financial situations under duress as well as help to aid future policy decisions.

2 BACKGROUND

2.1 Overview of the Period's National Economic Climate and Education Policies

State and local governments in the United States experienced significant fiscal stress as a result of the 2007 recession. The downturn in housing prices, employment, income, and business activity each contributed to smaller tax revenues and larger budget gaps.

Local governments have in the past relied heavily on property taxes, which in the beginning half of the decade were supported by a booming housing market. Housing prices in the United States had been increasing at an average rate of 7.8% between 2000 and 2006, but as delinquencies and foreclosures began to rise, home prices dropped to an average rate of -3.9% during the recession quarters.⁸ Demonstrating an even greater swing than the rest of the country, housing prices in New Jersey were increasing at a brisk average of 11.6% between 2000 and 2006, and fell to an average 4.7% decline in the recession quarters. This is one of the many contributors to the decline in revenues during the Great Recession.

⁸ For all figures related to home prices, we used the four quarter price change in the Federal Housing Finance Agency (FHFA) House Price Index averaged over the specified time period. Recession quarters are based on the National Bureau of Economic Research's report of the U.S. economic activity (see <http://www.nber.org/cycles/main.html>).

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. New Jersey specifically had relied heavily on the financial industry to provide an increasing portion of its revenues, but as the recession hit the finance sector hard, New Jersey's budget gap grew.⁹

As an attempt to remedy these depletions, 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. Qualitatively, districts were directed to use the ARRA funds to save and create jobs, to boost student achievement, and to bridge student achievement gaps. The quantitative requirements specify that 81.8% of the stabilization funds in education go toward the support of public education, and that states must restore for FY 2009, 2010, and 2011 support for public education to the greater of the FY 2008 or FY 2009 level.

Of the total \$100 billion designated to public education nationally, New Jersey appropriated \$2.23 billion. The largest portion of New Jersey's appropriation was used to implement the state's funding formula, and by the end of the 2010 school year, these funds had already been spent.

2.2 Overview of New Jersey Education History and Programs

In the state of New Jersey, any child between the age of five and eighteen has the constitutional right to a "thorough and efficient" education. Long before the start of the most recent recession, the true meaning of these words has been a topic of much public and legal debate. In the 1973 *Robinson v. Cahill* ruling, the State Supreme Court declared the New Jersey's school funding system to have failed to meet the state constitution's requirement of providing a "thorough and efficient" education for elementary and secondary schools. Much like the court orders to follow, this ruling was based on discrepancies in per-pupil spending among the state's school districts.

New Jersey enacted the 1975 Public School Education Act in response to the court's mandate, but there were still concerns relating to equity between rich and poor districts. In fact, the famous *Abbott v. Burke* litigation was first filed in 1981 on behalf of a group of students from four districts arguing that the funding disparities prevented poor, urban districts from receiving an adequate education. In 1985, the court ruled in favor of the plaintiffs, finding that wealthy districts spent an additional 40% more than poor districts. In this ruling, the court expanded the districts covered by the litigation to a group of 28 school districts that to this day are known as the Abbott districts. The resulting mandate required an immediate and significant increase in funding to these districts.¹⁰ This and the following Abbott court cases forever changed the way school districts were funded in New Jersey. In fact, by the time our dataset begins in the 1998-99 school year, the now 31 designated Abbott districts received 45% of the total state aid funds distributed to all 572 districts. This number increased to 51% by 2005 and remains at 50% as of 2010.

⁹ Deitz, et al (2010).

¹⁰ Resch (2008). Three districts have since been added to the Abbott district definition, totaling 31 as of this writing.

Despite the Abbott funding initiatives, the wealth disparities in New Jersey continued, as the non-Abbott poor districts remained under funded. The most well known poor, non-Abbott districts are the Bacon districts. These 16 rural, low-income districts have been the center of a separate series of court cases arguing for equitable education. Unlike the Abbott cases, the Bacon litigations did not precipitate additional funding for its districts. Instead the court ruled that each district faced a unique set of circumstances, and while they were “no less deserving” than the Abbott districts, the solution was for the Department of Education to re-examine the entire education system, citing that it “[was] time to abandon [the state’s] reliance on money as a surrogate for either education equity or adequacy”.¹¹

In January of 2008, Governor Jon Corzine’s School Funding Reform Act of 2008 (SFRA) was approved by legislature. The formula called for a 7% increase in state funding for K-12 education in the 2008-09 school year, and most noteworthy, it was the first time since 1990 in which the state aid formula did not include a special earmark assigned solely for Abbott districts. Instead, a uniform formula was applied to all districts with the division of funds determined based on the portion of low-income students as well as the number of students requiring special education.

In response to this new legislation, the Abbott plaintiffs yet again challenged the New Jersey education formula, disputing its constitutionality as defined in past cases. In May 2009, the state Supreme Court ruled unanimously that the state’s new education funding system indeed did meet the constitutional requirements for thorough and efficient education and allowed the system to continue. According to the New Jersey Department of Education, the new SFRA formula was fully met in the 2008-09 school year, and budgets were prepared for the 2009-10 school year using the SFRA formula. However midway through 2009-10, two key changes occurred. First, Governor Chris Christie came into office. Second, revenue streams came in at what was projected to be \$2.2 billion less than what was necessary to cover the state’s budget deficit. As quoted in the beginning of this paper, the state of New Jersey has a constitutional mandate requiring the Governor to maintain a balanced budget.

With revenue streams heavily depleted, Governor Christie faced some hard decisions. In an unprecedented movement, the Governor significantly reduced education funding midyear. The funding caps for district aid were cut, and many districts received less state aid than budgeted and less aid than required under the SFRA formula. Unsurprisingly, this 2009-10 midyear cut brought New Jersey back to the courtroom with the Education Law Center arguing on behalf of the *Abbott v. Burke* litigants. In March 2011, the New Jersey Supreme Court issued an opinion that the state was yet again failing in its constitutional requirement to provide children with a “thorough and efficient education”.¹²

¹¹ Source: http://caselaw.findlaw.com/nj-superior-court-appellate-division/1225307.html#footnote_7. This court ruling was made in January 2006.

¹² In May 2011, the Court required New Jersey to re-appropriate funds for Abbott districts to the levels required by SFRA, constituting an estimated \$500 million increase from the planned levels. Since the 2010-11 school year was nearly complete by the time this ruling was made, this \$500 million increase was made in the 2011-12 school year. Interestingly, the Court’s order applied only to the 31 Abbott districts, therefore the remaining districts, wealthy or otherwise, did not receive a re-appropriation following the mid-year cuts of 2009-10.

3 DATA

We developed a unique panel dataset that combines annual school district level data from multiple sources. The dataset covers 572 New Jersey districts and school years 1998-99 through 2009-10.¹³ Most of the finance data were obtained from the New Jersey Department of Education's Office of School Finance. We also supplemented this dataset with school finance data from National Center for Education Statistics's (NCES) School Finance Survey (F-33), as well as data from the US Census Bureau. Non-finance data were obtained from New Jersey Department of Education's Office of Data, Research, Evaluation and Reporting, NCES's Common Core of Data (CCD), and the Bureau of Labor Statistics (BLS).

We have data on total revenue, total expenditure, debt outstanding, as well as components of total revenue and expenditure. In addition to total revenue, we obtained data on amounts and percentage contributions of federal aid, state aid, and local revenue. Data on revenue from property taxes were also collected.

In addition to total district expenditure, detailed data were collected on the various components of expenditure: instruction, instructional support, student services, transportation, student activities, and utilities.¹⁴ Definitions for each of these variables, as well as a pie chart showing the contribution breakdown are shown in Appendix Table A2 and Appendix Figure A1. We also obtained data on median salary and median years of experience for teachers and administrators.¹⁵

Non-Finance data include district level data on various socio-economic and demographic variables. These include enrollment, racial composition, and percentage of students eligible for free or reduced price lunches. All revenue and expenditure variables are analyzed on a per pupil basis using each school year's average daily enrollment variable.

Heterogeneity breakdowns are performed by poverty level, urbanicity, district size, Metropolitan Division (MD), and legal designation. For poverty level, urbanicity, and district size, the 2008 levels are used to make the categorization in an effort to capture pre-recession levels. Poverty level is defined by the percentage of students eligible for free or reduced-price lunches, with the top 75% of the districts in our data identified as high poverty, the bottom 25% identified as affluent, and districts falling within the 25-75% range categorized as medium poverty.¹⁶ Urbanicity designations of rural, urban, or suburban are defined using the National Center for Education Statistics Common Core of Data (CCD) classifications.¹⁷

Heterogeneity breakdowns for metropolitan areas include the four largest New Jersey Metropolitan Divisions: Edison-New Brunswick, New York-White Plains-Wayne, Newark-Union,

¹³ Recall that when referring to the year of the data, this paper uses the spring term, for example 2009-10 is called 2010. Charter districts, non-operating districts, and districts that receive students via tuition only are not included in our analysis.

¹⁴ In the text of the paper, we refer to the variable for "utilities and maintenance" as "utilities" for simplicity.

¹⁵ All calculated district medians are reported in October of each school year, and the years experience variables are based on the total number of years in public education.

¹⁶ As of the 2006-2007 school year, districts in the top 75% poverty level had 27.4% of its students on free or reduced lunch, while the bottom 25% had 4.9% on free or reduced lunch.

¹⁷ Districts inside urbanized areas or inside urban clusters less than 35 miles from urbanized areas are categorized as urban. Territories outside principal cities and inside urbanized areas comprise the suburban districts. NCES uses the Census definition of rural territory based on the level of land developed.

and Camden (see Appendix Figure A4). We use ArcGIS mapping technology and Census data to visualize changes in financial variables as well as to map out the metropolitan divisions. The district and the metropolitan area shape files are obtained from the US Census Bureau. In a final round of heterogeneity analysis, the 31 districts represented in the Abbott trials are compared to the 16 districts represented in the Bacon trials as well as to the group of high poverty districts and the state as a whole.¹⁸

In order to adjust for inflation, all expenditure and revenue data were adjusted to 2010 dollars using annual values of the Consumer Price Index for all Urban Consumers which covers approximately 87% of the total population of the United States.

4 EMPIRICAL STRATEGY

The goal of this paper is to investigate whether the Great Recession and the Federal Stimulus funding period that followed were associated with shifts in New Jersey education financing. We conduct a trend shift analysis and use specifications (1) and (2) to analyze these effects.

$$Y_{it} = \alpha_0 + \alpha_1 T + \alpha_2 v_1 + \alpha_3 v_2 + \alpha_4 X_{it} + f_i + \varepsilon_{it} \quad (1)$$

where Y_{it} represents each school finance variable of school district i in year t ; T represents the time trend and takes a value of 0 in the immediate pre-recession year (2007-08) and increments by one for each subsequent year and declines by one in each previous year; f_i denotes school district fixed effects; X_{it} denotes controls for racial composition and poverty level (percentage of students eligible for free and reduced price lunches) of the district; $v_1 = 1$ if year ≥ 2009 and 0 otherwise; $v_2 = 1$ if year ≥ 2010 and 0 otherwise.

Local, state, and federal governments finalize their budgets in the spring prior to the budgeted year. More specifically, the budgets for the 2007-08 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, 2007-08 is taken as the last pre-recession year in this paper.

The coefficient α_1 represents the overall trend in the corresponding financial variable during the pre-recession period. The coefficients of interest are α_2 , representing the intercept shift at the onset of the recession, and α_3 , representing the additional intercept shift during the federal stimulus period. All regressions include district level fixed effects, f_i and control for the demographic and socio-economic composition of the district. The results are robust to the inclusion and exclusion of these covariates.

While the above specification uses intercept shifts, we also use an alternative specification where we model the shifts as trend shifts.

¹⁸ Note that Abbott and Bacon districts are mutually exclusive. Additionally, all 31 Abbott districts are also designated high poverty, while 13 of 16 Bacon districts are designated high poverty, the remaining 3 designated medium poverty.

$$Y_{it} = \beta_0 + \beta_1 T + \beta_2(T * v_1) + \beta_3(T * v_2) + \beta_4 X_{it} + f_i + \varepsilon_{it} \quad (2).$$

Here, the coefficients of interest are β_2 and β_3 , where β_2 represents the shift in trend (if any) during the recession, while β_3 represents any additional trend shift during the federal stimulus period.

While we estimate both specifications and the results are qualitatively similar, our preferred specification is specification (1), and we report results from this model. This is because data availability constraints cause the later specification to estimate the later trend shift β_2 from a single additional year of data, and we believe that estimation of a differential trend based on a single year of data may not be robust. Rather, intercept shift is a more natural formulation in this case.

While the above coefficients capture actual shifts, we also compute percentage shifts that are obtained by expressing the above shift coefficients as percents of the pre-recession (2008) base of the corresponding financial variable. These percent effects allow for an easier interpretation and are more informative as they give an idea about the size of the effects as well as facilitate comparison between the shifts in the various financial variables. In our discussion, we will focus on the discussion of two percentage shifts: first, the percentage shift immediately following the recession (in 2008-09), and second, the percentage shift in 2009-10 (computed by expressing the sum of the two effects α_2 and α_3 from specification (1) as a percent of the pre-recession base)¹⁹. The latter captures the combined effect of the recession and the federal stimulus in 2009-10.

4.1 Interpretation of the Treatment Effects

If there were common shocks in the two years following recession that had the capability to affect our financial variables, our estimates of the recession and stimulus effects outlined above would be biased. Understanding these potentially confounding factors is absolutely essential and helps us interpret the results and put them in perspective. Therefore, we conduct an exhaustive analysis of potential confounding factors during the period.

First, while interpreting the shift at the onset of the recession, α_2 , we consider the implementation of Governor Corzine's new school funding formula, SFRA. The formula called for a 7% increase in total state funding for K-12 education in the 2008-09 school year. Since state aid constitutes nearly half of the general formula aid to districts, this new state aid funding formula should be considered a positive shock not only to state aid, but also to total revenue, and total expenditure and its components. Since the shock of the Corzine funding formula is in the opposite direction as the recession shock, any negative shift in these variables in 2009 will be above and beyond the expected positive impact of the new funding formula. Therefore, it is safe to say that negative shifts (if any) in these variables in 2009 can be regarded as underestimates of the recession effects, however in the correct direction. In contrast, positive shifts could mean that the effect of the SFRA surpassed the effect of the recession or that the recession did not have much of a negative effect.

Also of note, Corzine's SFRA formula was the first time since 1990 in which the state aid formula did not include a special earmark assigned solely for Abbott districts. Therefore, in

¹⁹ For specification 2, the percent trend shift in 2009-10 is obtained by expressing the sum of the two effects β_2 and β_3 in specification 2 as a percent of the pre-recession base.

contrast to the rest of the state, the new funding formula acted as a negative shock to the Abbott districts. Therefore, any negative effects for the Abbott districts should be regarded as overestimates of recession effects, contributed by a combination of the Great Recession and the SFRA. Since Abbott districts constituted 20% of the high poverty districts in our data, estimates corresponding to the high poverty districts should also be interpreted keeping this in mind.²⁰

Second, while interpreting the 2010 stimulus shift, α_3 , we need to consider the impact of Governor Christie's mid-year cuts to the SFRA formula.²¹ With the negative impact to state aid funding, we would expect a dampening effect on the positive shock from the ARRA federal stimulus. Note, however, that these cuts only came mid-year and did not affect school's planned budgets or their expenditure in the first half of the school year. Any positive additional effects in 2010 (over 2009 effects) can therefore be regarded as underestimates of the stimulus effect. Additional negative effects in 2010, on the other hand, may mean that the effects of Governor's Christie's mid-year cuts dominated.

5 RESULTS

5.1 Overall Patterns

Using all 572 New Jersey districts in our dataset, Figure 1A shows the general statewide trends in per pupil expenditure and revenues, as well as trends in federal, state and local contributions to total revenue. The dotted vertical line represents the pre-recession year, and the horizontal axis represents the spring term of the school year with the last data point showing 2010. Both total expenditure and total revenue show declines in 2009. Despite a slight increase in 2010, the levels for total expenditure as well as for total revenue did not return to the pre recession per pupil levels. Federal revenue increased 1% between 2008 and 2009, and then jumped 35% between 2009 and 2010, the year of the federal stimulus funding. District reliance on federal aid spiked 32% between 2009 and 2010, while reliance on state aid dropped 16% over the same time period, demonstrating the shift in revenue contribution resulting from the combination of the Great Recession and the fiscal stimulus of 2010.

Figure 1B analyzes trends in the various components of expenditures. Instructional expenditures show evidence of flattening in 2009; however this pattern is reversed in 2010. In contrast, non-instructional categories such as transportation and utilities show either a flattening or decline in our years of interest. Teacher and administrator salaries (appendix Figure A3) show an upward shift in the post-recession period (at least in 2010). Below, we investigate whether these patterns continue to hold in a more formal trend shift analysis.

Table 1 presents results from the estimation of specification 1. Each table in this paper is structured in the same way. The top section of each panel presents the percent shifts, with the first row capturing the percent shift in 2008-09, the second row capturing the percent shift in

²⁰ It is not absolutely clear whether the high poverty districts as a whole were affected positively or negatively by SFRA because while the Abbott districts received less funding, the non-Abbott high poverty districts received more funding with the new formula. But, since the Abbott districts constituted only 20% of the high poverty group, the impact on the non-Abbott districts likely dominated, in which case one would expect them to be positively affected by the SFRA.

²¹ Midway through the 2009-10 school year, the funding caps for district aid were cut, and many districts received less state aid than budgeted and less aid than required under the SFRA funding formula.

2009-10, and the third row showing the pre-recession base. The bottom section of each panel presents the regression estimations from which the percent shifts were derived. Our discussion of results will focus on the percent shifts. For easier comparability and a visual representation, the shifts are also illustrated in histograms in Figures 3 through 7.

As Table 1 Panel A and Figure 3 show, both total expenditure and revenue experienced declines in 2008-09, signifying the negative effect of the recession. Note that these effects are likely underestimates of the corresponding recession effects because the change in the state funding formula in the form of SFRA (as discussed earlier) had a positive effect on overall school revenue. While declines are evident in 2010 as well, they are somewhat more modest, at least for total expenditure per pupil.

As expected, federal aid per pupil shows a sharp increase in 2010, coinciding with the infusion of federal funds with the stimulus²². In contrast, state aid per pupil shows declines in both years after the recession. Recall from earlier discussion that the SFRA led to an upward shift in state aid per pupil in 2009, so the decline in 2009 is likely an underestimation of the true recession effect. Digging deeper, we find that although the SFRA formula was honored in 2009 as publicized, state level cuts in categories outside the SFRA formula led to the negative shift in overall state aid, specifically in pension funding.

Historically there has been a significant portion of state aid distributed to the Teachers' Pension and Annuity Fund (TPAF). TPAF pension funding is not stipulated in the SFRA formula, so in 2009 when the onset of the recession brought depleted revenue flows, pension funding was cut dramatically. Appendix Figure A2 shows the trends in total state aid, TPAF funding, and state aid less TPAF funding with the gray dotted line representing the immediate pre-recession school year. While total state aid declined between 2008 and 2009 in large part due to the decline in TPAF funding, state aid less TPAF increased. This figure shows that while SFRA insulated other parts of state aid, the recession adversely affected TPAF funding which in turn negatively impacted total state aid per pupil.

These patterns are also reflected in a formal trend shift analysis of the individual state aid components—the corresponding estimates are not reported to save space, but are available on request. The situation in 2010, however, was different. Although the state budgets for 2010 were established using the SFRA formula, revenue streams that year were less than expected, and in an unprecedented movement, the funding formula was revamped significantly midyear. The funding caps for district aid were cut, and many districts received considerably less state aid than budgeted and less aid than required under the SFRA funding formula. Indeed, Figure A2 shows that declines are evident in both total state aid as well as in state aid less TPAF.

²² It is worth pointing out here that the coefficient estimate for 2009 provides evidence of a negative shift in 2009. This is due to the fact that there was a sharp positive trend in federal revenue per pupil in the initial years of our data, while the trend changed to flat or slightly negative in the years preceding the recession (Figure 1A). The consequence was the existence of a large positive pre-trend (Table 1) for federal revenue per pupil which in turn led to a negative shift estimate for 2009, although 2009 pattern was in line with its immediate preceding years. To investigate how much the 2009 negative shift is an artifact of the positive trend in the previous years, we re-estimate specification (1) using data from 2004 through 2010 for federal revenue per pupil. Now, there is no evidence of any negative shift in 2009, rather a small positive shift that is statistically indistinguishable from zero. In contrast, there is still strong and statistically significant evidence of a large positive shift in 2010. These results are available on request.

Results for both years suggest that the Great Recession had a marked negative impact on state aid to districts.

As would be expected given the negative recession shock to housing prices and local revenue streams, local revenue per pupil and property taxes per pupil show negative shifts in both years after the recession. It follows from the above analysis that without the support of the federal stimulus in 2010, total aid to districts would have declined even further from their nevertheless depleted levels.

Table 1 Panel B illustrates shifts in percentage contributions of the federal, state and local contributions to total revenue. The patterns reveal that the above changes led to districts relying less on state aid and instead, becoming more largely funded by federal aid in the 2010 school year. Thus, the Great Recession and the associated infusion of funds from the Federal Stimulus package seem to have led to a shift in the composition of revenue in New Jersey. Figure 2 provides additional illustration of the increased reliance on federal aid, mapping the distribution of percent contribution in federal aid in 2007-08 (the immediate pre-recession year) and 2009-10. As can be seen, there was a nearly across the board increase in federal contribution to total revenue.

The variable for total debt outstanding per pupil represents total long term debt at the end of the school year. The % shifts for debt outstanding are statistically significant and negative both in 2009 and 2010. In New Jersey, districts are not permitted to take out debt to cover current expenses, so the majority of debt is used for school construction. Since there were fewer plans for construction made in light of the recession, there were significant declines in debt outstanding in both school years. Finally, column (11) in table 1 Panel B shows evidence in favor of negative shifts in student enrollment in both years after recession.

While total expenditure suffered declines in both years after the Great Recession hit, it would be interesting to investigate whether the various component expenditure categories followed similar patterns. Table 2 and the lower panel in Figure 3 analyze this question. Interestingly, there are marked variations in the impacts sustained by the various component expenditure categories. While instructional expenditure suffered a negative shift in 2009, there is no evidence of any negative effect in 2010. This pattern is repeated for instructional support per pupil and student services per pupil. These are in spite of the 2010 Christie cuts to education budget discussed above. These patterns provide suggestive evidence that the federal stimulus funding, over 90% of which was used in the 2009-10 school year, have helped temper the negative effect of the recession, at least on these categories. In contrast, other non-instruction categories such as transportation and utilities suffered statistically significant declines in both years after the recession. Conversations with New Jersey Department of Education staff revealed that faced by strained budget conditions, New Jersey cut back on non-essential transportation costs, such as courtesy busing.²³ This is consistent with the above patterns in transportation spending evidenced in our data.

²³ Courtesy busing is the provision of busing for non-mandatory students such as students living within walking distance from the school or who otherwise have a reasonable alternative to busing.

It is worth noting here that the patterns suggest that New Jersey tried to maintain the expenditure categories most related to student learning and development. Instructional expenditure, which includes teacher salaries and classroom expenditure, constitutes the spending category that most directly interacts with students' learning. With the stimulus funds coming in, there is no evidence of the negative effects on this category that we see in the previous year prior to the stimulus. Like instructional expenditure, instructional support, student services, and student activities closely relate to the development of the student. These categories, combined with instructional expenditure, are arguably the categories that most directly impact a students' access to a thorough and efficient education. In summary, our results show that the post-recession period was characterized by a shift in composition of expenditures in favor of categories that are linked most closely to students' learning and development.

The last two columns in Table 2 Panel B investigate the impacts on median teacher salary and median administrator salary following the Great Recession. Some intriguing patterns emerge. Teacher salary shows upward shifts in both years after recession. While administrator salary shows a downward shift in the first year after recession, it shows a positive shift in the second year. To understand and interpret these results, there are two key factors to consider.

First, education personnel retirements spiked in these two school years, as rumors that the new governor would cut pension funding spread across districts.²⁴ New Jersey is one of the few states in which the state funds pensions, and with state revenue streams depleted, pensions were seen as a probable area to cut. Since teachers and administrators at the age of retirement tend to have the highest salaries, an increase in retirements would logically lead to a decline in the overall median salary. This is not what we see for teacher salary; however the increase in administrative retirements in 2009 is consistent with the negative shift in median administrative salary we see that year. This mechanism is corroborated by the patterns we observe in median years of experience of administrators. Though not statistically significant, column (2) in Appendix Table A1 shows evidence of a small decline in the administrators' years of experience. This may have potentially contributed to the decline in the administrators' median salary.

However, there is more to the story. To understand fully the patterns in teacher and administrator salary, we have to consider the second key factor: tenured dismissal. In New Jersey, public school employees attain tenure in their third year of employment. With tenure, it becomes very difficult for an employee to be fired without extraordinary cause.²⁵ As a result, the vast majority of lay-offs in New Jersey public education affect employees in their first and second years, reducing the number of lower level salaries. As Appendix Table A1 column (1) shows, there is strong evidence of large positive shifts in teachers' years of experience in both 2009 and 2010, and both these effects are highly statistically significant. These results supports the hypothesis that dramatic cuts in lower level employees shifted the overall median teacher salary up significantly in both years. Administrative employees' years of experience also showed a positive shift in 2010, although it was not statistically significant. These patterns

²⁴ Surmised using data available from the Department of the Treasury Division of Pensions and Benefits.

²⁵ New Jersey Permanent Statutes Database, Section 18a:6-10.

provide evidence that the significant positive shifts in median teacher and administrative salaries are likely due to lower level culling in public education employees during the post-recession era.

5.2 Examining Heterogeneities by School District Poverty Level

While the above analysis focuses on aggregate patterns, the rest of the paper takes a closer look to investigate whether there were differences in impacts within the state by various characteristics such as poverty status, location, and urbanicity. To save space, this analysis focuses only on a subset of the finance indicators analyzed above—the indicators that are of most interest—the various components of expenditure. This analysis provides valuable insight as to 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.

Discussions about fiscal spending on education in New Jersey are most often framed by the discussion of wealth levels. In this vein, Table 3 and Figure 4 present the results for variations by poverty. The affluent districts fared best in terms of instructional expenditure as well as in most of the non-instruction expenditure categories (instructional support, student services, and transportation). They also experienced the largest upward shifts in both teacher salaries and years of experience for both years after the recession. The combined results for teacher salaries and years of experience imply that affluent districts may have had the largest instance of lower level teacher layoffs. Affluent districts had the smallest declines in utilities in 2009, but their experience in 2010 was not very different from the high and medium poverty districts in this category.

Most noteworthy in the poverty heterogeneity results is the comparatively large declines experienced by high poverty districts in both instruction and non-instruction categories. The most disparate examples are the shifts in student services and instructional support variables in 2010—while high poverty districts show large statistically significant declines, the affluent districts show large and significant increases. The variables for student services and instructional support capture the expenditure on services that are designed to support, assess, and improve students' well-being. They include social work, health services, technology, library costs, and student guidance. These are surprising areas to see cuts in the districts hosting New Jersey's poorest and arguably most susceptible students.

5.3 Examining Heterogeneities by Urbanicity

Perhaps the second most discussed characteristic of school districts in any conversation about New Jersey education financing has been urbanicity. Historically, since urban districts generally have lower property values and more apartment buildings that house multiple families, the ratio of students to potential sources of tax income was comparatively higher. The result was a large disparity between the per-pupil aid available for wealthier, non-rural districts as compared to poorer, urban districts. Much of the controversy in the Bacon districts' accusations against the state has surrounded around the fact that the Abbott districts had received special treatment due to their high poverty, urban status. The Bacon districts argue that they are just as impoverished, and their rural status should not have prevented them from receiving the same

treatment as their urban counterparts. Given the relevance of urban status in New Jersey's history, we analyze heterogeneities accordingly.

Table 4 and Figure 5 analyze variations by urban status. Once again, while all three groups of districts exhibit statistically significant declines in instructional expenditure in the first year after the recession hit, there is no evidence of negative effects in 2010, suggesting stimulus funding might have helped. This pattern has repeated itself consistently throughout our results and suggests that the districts in general strived to preserve their instructional expenditure. While the decline in instructional expenditure in 2009 is most prominent for urban districts, the experiences in 2010 are very similar across the three groups of districts.

In most non-instruction categories (instructional support, student services, transportation, student activities), the rural districts fared the best, while the urban districts fared the worst. The experiences of the three groups were very similar for utilities.

All three groups show positive shifts in teacher salary and experience. However, rural districts show smaller spikes in both teacher salary and years of experience as compared to the suburban and urban districts, suggesting the lower level teacher lay offs may have been less prominent in rural districts.

5.4 Examining Heterogeneities by Metropolitan Area

We next look at the variations by metropolitan area, analyzing the four largest Metropolitan Divisions (MD): 1) New York-White Plains-Wayne, 2) Edison-New Brunswick, 3) Newark-Union, and 4) Camden. Figure A4 shows a map of New Jersey with the metropolitan areas defined. Newark constitutes the northwest portion of the state and includes the most affluent districts. Slightly east of Newark, the Wayne districts are second in terms of wealth and also have the largest population of Hispanic and Asian students. Edison districts are similar in demographics to Wayne, however tend to be larger in size. Camden districts have the highest instance of poverty, the largest black student population, and the largest number of small sized districts.

Table 5 and Figure 6 analyze the variations of impacts by metropolitan divisions. While all four MDs suffered declines in instructional expenditure, this pattern was reversed in 2010 when they each shifted upward slightly. Camden endured the largest decline in 2009, while the experiences of the various MDs in 2010 were very similar with the exception of Edison. Edison exhibited an upward shift that was about double the shifts of the other MDs. In most of the non-instruction categories, Edison stands out as having the largest upward shifts. All MDs show positive shifts in teacher salaries and years of experience in both years, with Wayne showing the largest increase in both years in both the categories. In summary, our results show that there were quite some variations across MDs and they also provide evidence that different New Jersey regions reacted in different ways to a lack of resources.

5.5 Abbott and Bacon Districts: Examining heterogeneities by Legal Designation

Given the unique role of the 31 Abbott districts in the history of New Jersey education policy, we investigate whether the experience of the Abbott districts following the Great Recession diverged from the other districts. As an interesting comparison, we include the same analysis for the 16 Bacon districts and compare both groups to the high poverty districts. Results are shown in Tables 6 and 7. These results are visually represented in the form of histograms in Figures 7A, 7B, and 7C. For a more complete comparison and a fuller picture, these histograms also include estimates for four other categories—districts without a legal designation (labeled No Legal Des.), Medium poverty districts, Affluent districts, and the state of New Jersey as a whole.²⁶

In 2009, the Abbott districts were not only affected by the recession, but they also faced a new legislation that allocated state funds under the same formula as the rest of the state. This formula was in effect for two years: 2009 and 2010. In the pre-recession era, Abbott districts received and spent considerably more than the other districts in New Jersey. For example, in the immediate pre-recession year, the Abbott districts spent \$2,328 more per pupil than their high poverty counterparts, and \$4,772 more than the Bacon districts. Thus, unlike the other New Jersey districts, the Abbott districts faced two negative shocks: the Great Recession and the negative shock in the form of the SFRA.

As might be expected, both total revenue and total expenditure in the Abbott districts showed considerably sharper declines than the high poverty districts and the Bacon districts. Following the multiple Abbott court cases, the Abbott districts had a much higher pre-existing trend in state aid per pupil before the recession. As would be expected, their shifts for state aid per pupil in both 2009 and 2010 are negative, significant, and larger in magnitude as compared to the rest of the state, and as compared to other high poverty districts. In fact, as can be seen from Figure 7A, these negative shifts exceeded those in all the other groups of districts including the whole state.

The federal stimulus led to positive shifts in the federal aid per pupil for all the above groups in 2010. But, of note here is that the positive shift is the smallest in the Abbott districts. This is because the state distributed the stimulus funds according to the state funding formula (SFRA), and the pre-existing trend in the federal aid per pupil in the Abbott districts was also among the highest.

The patterns for property taxes and local revenue variables are also interesting. Unlike the rest of the state, as well as any of the other groups analyzed in this paper, the Abbott districts showed a significant upward shift in property taxes and local revenue in 2009, suggesting that property taxes were raised in these districts as a method of compensating for the substantial decline in state aid.

Table 7 and Figure 7B investigate the patterns in the various components of expenditure in these groups of districts following the recession. The results are striking. Across nearly all

²⁶ The label “No legal Des.” constitutes any district that is not classified as either Abbott or Bacon.

variables, both instructional, and non-instructional, the Abbott districts suffered the largest falls and the smallest increases. The only exception seems to have been utilities where the Abbott districts fared better than the other groups.

Noteworthy in these results is the fact that the Abbott districts were the only group in our entire set of heterogeneity categories that failed to return instructional expenditure at least to pre-recession trend levels. The Abbott districts were the only group that saw a large statistically significant downward shift in instructional expenditure in 2010, even in spite of the influx of the stimulus funds. Given that the instructional expenditure is the key expenditure category that most directly interacts with students' learning, this shift may not bode well for students in Abbott districts. These results suggest that while the rest of the state seemed to have shifted spending toward instruction and away from non-instruction categories, the Abbott districts' revenues declined enough that no spending category was preserved.

The picture for teacher salary and years of experience is also interesting. The Abbott districts show the largest upward shifts in teacher salary in both years following the onset of the recession. As Figure 7C shows, this can be explained by the change in teacher composition. The graph shows that the Abbott districts witnessed the largest increases in teacher experience following the recession, suggesting that the tighter budget conditions prompted the Abbott districts to shed their untenured less experienced teachers much more than any of the other groups of districts.

5.6 Studying the Role of Potential Confounding Factors

It is important to frame our results with a thorough understanding of the potential confounding factors that may have affected our coefficients of interest. First, while interpreting the shift at the onset of the recession, α_2 , we need to take into account the implementation of Governor Corzine's new school funding formula, SFRA in 2009. This shock should have a positive impact on the state as a whole (while having a negative impact on Abbott districts). Analysis of overall patterns in section 5.1 show statistically significant declines in total expenditure, total revenue and state aid in 2009, despite the presence of the SFRA formula. Declines are observed in the various component expenditure categories as well. While interpreting the results, it should be kept in mind that the effects in 2009 capture the joint effect of the Great Recession and the change in the state funding formula. However, since the SFRA acted as a positive shock, the effects are likely underestimates of the recession effects, but not overestimates. Thus, the above 2009 effects can be looked upon as lower bounds of the effects on the respective financial variables.

The Abbott districts deserve special mention here. The impact on all other districts at the onset of the recession was decidedly negative. However, the change in the school funding formula with the implementation of SFRA affected Abbott districts in a way very different from the other districts. While the other districts received a funding boost, SFRA affected Abbott Districts' revenues negatively, as the new state funding formula no longer provided Abbott districts with the special earmark they had received in every other year of our dataset. Therefore the 2009 effects of the Abbott districts capture the effect of two negative shocks: the Great Recession and SFRA. Since both shocks acted in the same direction, it is difficult to even place bounds on

the recession effects for the Abbott districts. Instead, the effects for the Abbott districts should be taken as a combination of the effects from the two negative shocks.

While interpreting the 2010 stimulus shift, α_3 , we need to consider the impact of Governor Christie's mid-year cuts to the SFRA formula. In other words, the 2010 effects capture not only the effect of the stimulus and recession (that we would ideally like to estimate), but also capture the effect of the Christie cuts. For total expenditure and revenue as well as for most of the expenditure component variables, the effects in 2010 are milder than that the 2009 negative effects. This provides suggestive evidence that that federal stimulus had positive effects on school finance in New Jersey. However, the effects should be considered underestimates, as the mid-year funding cuts acted in the opposite direction to the federal stimulus.

6 CONCLUSION

There are few more compelling stories in recession than those of the children of a nation. The investment in the education of children has well established relevance to the rebuilding of a nation and its potential for human capital advancement. Despite this, there has been virtually no literature studying the effect of the Great Recession, or past recessions, on schools. Our paper starts to fill this gap.

In this paper, we have explored how school finances in New Jersey were affected during the Great Recession and the federal stimulus funding period that followed. Applying this analysis to New Jersey has specific relevance for many reasons. For one, the amount of money spent per pupil in New Jersey ranks at one of the highest levels in the nation. Additionally, there have been few states' education policies that have intertwined with the United States' legal system or public political debate to the extent of New Jersey. The state provides a unique opportunity for school finance analysis because of its unprecedented law requiring the 31 Abbott districts to receive funding under a different formula than the rest of the state. The many Abbott and Bacon litigations have made New Jersey the paramount example in any analysis of the disparity between poor, urban districts, and their wealthy counterparts.

Using unique panel data on a multitude of school finance variables, we apply trend shift analysis to analyze how school revenues, expenditures, and their components were affected during the Great Recession and federal stimulus periods.

The analysis yields some interesting results. There is strong evidence of downward shift in both revenue and expenditure following the recession in New Jersey. Federal stimulus seemed to have helped in 2010—while both variables still exhibit declines, they are somewhat smaller than that in 2009. There is strong evidence of substitution of funds on the revenue side—the infusion of funds with the federal stimulus occurred simultaneously with statistically and economically significant cuts in state and local financing, especially the former. As a result of these changes, reliance on federal aid increased in 2010, while reliance on state aid declined. Without the support of the federal stimulus in 2010, our results suggest that total aid to districts would have declined significantly more than it did in actuality.

Our results also show that the post-recession period was characterized by a compositional shift in expenditures in favor of categories that are linked most closely to students' learning. The categories for instructional expenditure, instructional support, student services, and student activities were preserved in 2010 when districts received the support from the ARRA funding²⁷. In contrast, transportation and utilities expenditures declined, suggesting that New Jersey prioritized the preservation of the expenditure categories most related to student learning and development.

We also find some interesting patterns in the education employee (teacher and administrator) labor market. The results for the salary and years of experience variables provide evidence for lower level culling in public education employees during the post-recession era. As revenue streams were depleted, New Jersey's law for tenured dismissal—the law that makes lay offs nearly impossible for any employee past his or her third year of employment—appears to have taken priority in officials' decisions regarding teacher and administrator job preservation.

In addition to studying the overall impact of the recession, we also study if the effects varied by poverty, urban status, metropolitan area, and legal designation. Given the unique role of the 31 Abbott districts in the history of New Jersey education policy, we investigate whether the experience of the Abbott districts following the Great Recession diverged from the other districts.

As shown, the results provide evidence of considerable heterogeneity. The high poverty and urban groups sustained the largest falls in the post-recession era, and Abbott districts shifted the furthest from pre-recession trends. The most disparate examples in the poverty heterogeneities are the shifts in student services and instructional support variables in 2010. The high poverty districts and Abbott districts in particular, show large statistically significant declines in these categories, while the affluent districts show large and significant increases. These variables capture the expenditure on services that are designed to support, assess, and improve students' well-being, including social work, health services, technology, library costs, and student guidance. It is unexpected to observe cuts in these categories linked most closely to students' learning and well-being, especially in the districts hosting New Jersey's poorest and arguably most susceptible students.

Also noteworthy is the finding that Abbott districts were the only group in our entire set of heterogeneity categories that failed to return instructional expenditure at least to pre-recession trend levels. While the rest of the state seemed to shift spending toward instruction and away from non-instruction categories, the Abbott districts' revenues declined enough that no spending category was preserved.

Since New Jersey spent its appropriation of ARRA funds in 2010, a valid question here is how we might expect the state to fare in the near future. Considering the slow recovery of economic activity and employment in the state, state and local revenues will likely continue below trend.

²⁷ While Instructional support saw a small (less than 1%) negative shift in 2010, it is statistically not different from zero and considerably smaller than the negative shift in 2009, suggesting stimulus funding helped to moderate the negative effects and preserve it approximately at trend level. The other categories showed small positive or zero effects in 2010.

The cessation of the federal stimulus funding and lower than trend growth of state and local revenues could lead to more significant downward pressures on revenues and expenditures, and various components of expenditures. In fact, some of this is already being evidenced.

Using a compilation of the annual budgets for the United States and the state of New Jersey, Figure 8 plots budgeted and actual revenue per pupil during 2000-2012. The Figure shows a noticeable decline of budgeted revenue after 2010. It also demonstrates that New Jersey's Treasury department budgeted for steeper declines in 2011 as compared to the nation as a whole.

The state's budget publication for the 2011 school year explicitly states that funds were not available to replace the ARRA federal funding of the year prior. The funding allocations required by the state's funding formula (SFRA) were not met, and though the actual data for 2011 is not available as of this writing, the budget shows state wide declines, with many districts' aid declining by as much as 5% from the year prior. Cuts were made in many expenditure categories: the planned expansion of the preschool program was stalled, special education costs and non public school aid reflect a 15% reduction from the projected need, debt service aid was reduced by 15%, and funding for adult education was cut entirely. Data from the Department of Education show that the number of full- and part-time public school teachers in New Jersey dropped by 4%, while the number of administrators dropped by 7% in 2011.

As economists are predicting continued economic troubles through 2012, school districts will likely face hard decisions ahead that might involve cutting in the salient instructional expenditure category. This possibility could have potentially deleterious effects on human capital formation, and by extension, our nation's future. The findings of this paper contribute to the understanding of schools' financial situations during recession and can serve as a guide to aid future policy decisions.

REFERENCES

- Baker, Bruce D. 2009. "Within District Resource Allocation and the Marginal Costs of Providing Equal Educational Opportunity: Evidence from Texas and Ohio." *Education Policy Analysis Archives* 17, no. 3:1–31.
- Barro, Robert J. 1991. "Economic Growth in a Cross Section of Countries." *Quarterly Journal of Economics*, May 1991, 106(2), pp. 407-43.
- Becker, Gary S. 1994. "Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education (3rd Edition)". *The University of Chicago Press*.
- Bedard, Kelly, and Brown, William O. Jr. 2000. "The allocation of public school expenditures." Claremont Colleges Working Papers, number 2000-16.
- Benhabib, Jess and Spiegel, Mark M. 1994. "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross Country Data." *Journal of Monetary Economics*, October 1994, 34(2), pp. 143-74.
- Betts, Julian R. 1995. "Which types of public school spending are most effective? New evidence on the school quality debate." University of California at San Diego, Economics Working Paper Series 95-03, Department of Economics, UC San Diego.
- Deitz, Richard, et al. 2010. "The Recession's Impact on the State Budgets of New York and New Jersey." *Current Issues in Economics and Finance*, Volume 16, Number 6 (June/July 2010).
- Feldstein, Martin. 1978. "The effect of a differential add-on grant: Title I and local education spending." *Journal of Human Resources*, 13(4):443-458.
- Firestone, William A., Goertz, Margaret E., Nagle, Brianna, and Smelkinson, Marcy F. 1994. "Where did \$800 million go? The First year of New Jersey's Quality Education Act." *Educational Evaluation and Policy Analysis*, 16(4):359-373.
- Firestone, William A., Goertz, Margaret E., and Natriello, Gary. 1997. "From Cashbox to Classroom: The Struggle for Fiscal Reform and Educational Change in New Jersey." *Teachers College Press*, New York.
- Gerst, Jeremy and Wilson, Daniel. 2010. "Fiscal Crises of the States: Causes and Consequences." Federal Reserve of San Francisco *Economic Letter*, no. 2010: 20 (June 28).
- Gordan, Nora. 2004. "Do federal grants boost school spending? Evidence from Title I." *Journal of Public Economics*, 88(9-10):1771-1792.
- Hanushek, Eric. A and Woessmann, Ludger. 2007. "The Role of Education Quality in Economic Growth". *World Bank Policy Research Working Paper* 4122, (February 2007).
- New Jersey State Constitution. 1947.
<http://www.njleg.state.nj.us/lawsconstitution/constitution.asp>. (Accessed December 1, 2011).

- Resch, Alexandra M. 2006. "The Effects of the Abbott School Finance Reform on Student Achievement in New Jersey." *Public Economics Papers*.
<http://www.mendeley.com/research/the-effects-of-the-abbott-school-finance-reform-on-student-achievement-in-new-jersey/> (Accessed November 3, 2011).
- Rubenstein, Ross et al. 2007. "From Districts to Schools: The Distribution of Resources across Schools in Big City School Districts." *Economics of Education Review* 26, no. 5: 532–545.
- Stiefel, Leanna and Schwartz, Amy Ellen. 2011. "Financing K-12 Education in the Bloomberg Years, 2002-2008." *Education Reform in New York City*, 55-86.

Table 1: Examining Patterns in Revenues and Expenditures Per Pupil during the Financial Crisis and Fiscal Stimulus Period

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	Total Expenditure Per Pupil FE	Total Revenue Per Pupil FE	Federal Aid Per Pupil FE	State Aid Per Pupil FE	Local Revenue Per Pupil FE	Property Taxes Per Pupil FE
% Shift in 2008-09	-9.51***	-12.68***	-17.5***	-4.02***	-3.36***	-2.81***
% Shift in 2009-10	-8.48***	-12.58***	13.02***	-18.46***	-2.66***	-1.74**
Pre-Recession Base	20,180	23,460	565	6,220	11,539	11,093
Trend	567.6*** (25.0)	694.9*** (38.9)	15.3*** (2.0)	116.4*** (6.3)	349.16*** (10.9)	326.33*** (10.2)
Recession	-1919.0*** (161.0)	-2974.1*** (295.1)	-98.8*** (16.6)	-250.2*** (48.8)	-387.61*** (66.3)	-311.28*** (63.2)
Stimulus	208.2 (195.2)	24.9 (338.9)	172.4*** (18.2)	-897.9*** (59.8)	80.67 (93.6)	118.39 (89.9)
Observations	6753	6753	6753	6753	6753	6495
R2	0.576	0.511	0.829	0.936	0.869	0.884
Panel B	(7)	(8)	(9)	(10)	(11)	
	% Fed Aid FE	% State Aid FE	% Local Aid FE	Tot Debt Outstanding Per Pupil FE	Total Students FE	
% Shift in 2008-09	-10.81***	4.01***	7.48***	-19.59***	-3.56***	
% Shift in 2009-10	20.71***	-10.82***	7.58***	-23.37***	-4.26***	
Pre-Recession Base	2	27.8	51.3	8,062.5	2,384.9	
Trend	0.01 (0.0)	-0.27*** (0.0)	0.10* (0.1)	361.1*** (35.5)	14.4*** (1.5)	
Recession	-0.26*** (0.1)	1.12*** (0.2)	3.84*** (0.4)	-1578.8*** (276.9)	-85.0*** (14.3)	
Stimulus	0.76*** (0.1)	-4.12*** (0.3)	0.05 (0.5)	-305.3 (339.5)	-16.4 (18.9)	
Observations	6759	6759	6759	6626	6753	
R2	0.799	0.926	0.784	0.577	0.995	

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

Table 2: Examining Patterns in the Compositions of Expenditures during the Financial Crisis and Fiscal Stimulus Period

Panel A	(1)	(2)	(3)	(4)
	Instructional Expenditures Per Pupil	Instructional Support Per Pupil	Student Services Per Pupil	Transportation Per Pupil
	FE	FE	FE	FE
% Shift in 2008-09	-2.14***	-2.12**	-2.0**	-3.21***
% Shift in 2009-10	0.14	-0.86	0.97	-5.41***
Pre-Recession Base	7,787	1,909	1,599	763
Trend	165.4*** (5.9)	66.3*** (2.3)	57.4*** (1.8)	17.2*** (1.1)
Recession	-166.5*** (38.9)	-40.5** (18.2)	-31.9** (14.4)	-24.5*** (9.1)
Stimulus	177.6*** (48.9)	24.2 (25.0)	47.4** (19.2)	-16.8 (12.3)
Observations	6752	6752	6752	6744
R-squared	0.627	0.704	0.742	0.825

Panel B	(5)	(6)	(7)	(8)
	Student Activities Per Pupil	Utilities and Maintenance Per Pupil	Teacher Salary	Admin Salary
	FE	FE	FE	FE
% Shift in 2008-09	0.81	-2.35***	1.32***	-1.16***
% Shift in 2009-10	1.18	-4.50***	6.45***	1.55***
Pre-Recession Base	238	1,615	57,598	107,074
Trend	5.0*** (0.3)	49.3*** (1.6)	-387.8*** (39.2)	130.9* (73.0)
Recession	1.9 (2.5)	-37.9*** (11.8)	761.3*** (215.8)	-1239.4*** (457.4)
Stimulus	0.9 (3.1)	-34.9** (15.0)	2956.5*** (253.7)	2896.3*** (592.5)
Observations	6685	6752	5614	5605
R-squared	0.959	0.728	0.815	0.787

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

Table 3: Examining Heterogeneities by School District Poverty Levels

Panel A	<u>Instructional Exp. Per Pupil</u>			<u>Instructional Support Per Pupil</u>			<u>Student Services Per Pupil</u>		
	High Poverty FE	Medium Poverty FE	Affluent FE	High Poverty FE	Medium Poverty FE	Affluent FE	High Poverty FE	Medium Poverty FE	Affluent FE
% Shift in 2008-09	-3.24***	-2.64***	-1.29	-5.25**	-2.15*	-0.74	-4.69**	-2.63**	-0.37
% Shift in 2009-10	-1.91	0.40	0.73	-7.78***	0.77	3.53	-5.04**	1.30	4.93**
Pre-Recession Base	8,035	7,678	7,722	2,112	1,799	1,898	1,733	1,519	1,605
Trend	228.5*** -14.8	172.1*** -8	98.6*** -9	100.6*** -7.5	56.3*** -2.7	53.8*** -3.4	88.1*** -5	49.8*** -2.3	45.1*** -3.2
Recession	-260.7*** -90.8	-202.9*** -49.6	(99.9) -64.8	-110.9** -45.1	-38.7* -20.4	(14.1) -30.6	-81.3** -34.2	-40.0** -17.7	-6.0 -27
Stimulus	107.3 -97.4	233.9*** -70.2	156.6* -94.9	(53.5) -58.1	52.6* -28	81.1 -50.4	(6.1) -36.4	59.7** -26.6	85.1** -41.6
Observations	1711.0	3259.0	1782.0	1711.0	3259.0	1782.0	1711.0	3259.0	1782.0
R-squared	0.444	0.817	0.827	0.634	0.806	0.8	0.693	0.809	0.793

Panel B	<u>Transportation Per Pupil</u>			<u>Student Activities Per Pupil</u>			<u>Utilities and Maintenance Per Pupil</u>		
	High Poverty FE	Medium Poverty FE	Affluent FE	High Poverty FE	Medium Poverty FE	Affluent FE	High Poverty FE	Medium Poverty FE	Affluent FE
% Shift in 2008-09	-6.20***	-3.27***	-0.82	0.81	0.72	0.49	-2.32	-3.61***	-1.60
% Shift in 2009-10	-10.0***	-3.15	-4.31	2.92	0.27	-0.37	-5.26***	-4.31***	-4.70***
Pre-Recession Base	742	774	767	196	242	278	1,723	1,577	1,569
Trend	28.9*** (2.7)	16.6*** (1.3)	5.9** (2.3)	4.6*** (0.5)	5.8*** (0.4)	4.0*** (0.6)	64.7*** (3.9)	50.5*** (2.3)	34.9*** (3.0)
Recession	-46.0*** (17.4)	-25.3*** (9.1)	-6.3 (26.3)	1.6 (4.3)	1.7 (3.5)	1.4 (5.5)	-39.9 (25.1)	-56.9*** (15.8)	-25.1 (21.4)
Stimulus	-28.2 (18.7)	0.9 (17.0)	-26.7 (32.3)	4.1 (5.0)	-1.1 (4.5)	-2.4 (6.7)	-50.8* (26.7)	-11.1 (23.4)	-48.7* (29.5)
Observations	1711	3258	1775	1686	3230	1769	1711	3259	1782
R-squared	0.822	0.901	0.752	0.934	0.966	0.965	0.667	0.81	0.802

Panel C	<u>Median Teacher Salary</u>			<u>Median Teacher Years of Experience</u>		
	High Poverty FE	Medium Poverty FE	Affluent FE	High Poverty FE	Medium Poverty FE	Affluent FE
% Shift in 2008-09	0.62	1.27**	2.39***	7.81***	8.52***	13.16***
% Shift in 2009-10	5.23***	6.59***	8.27***	14.65***	15.15***	26.32***
Pre-Recession Base	57,374	57,379	58,308	10.24	10.56	9.12
Trend	-77.4 (87.2)	-409.8*** (57.8)	-591.4*** (72.0)	-0.3*** 0.0	-0.4*** 0.0	-0.5*** 0.0
Recession	358.3 (427.4)	726.6** (315.1)	1391.4*** (418.6)	0.8*** (0.2)	0.9*** (0.2)	1.2*** (0.2)
Stimulus	2644.5*** (431.2)	3057.0*** (385.8)	3428.7*** (508.4)	0.7*** (0.2)	0.7*** (0.2)	1.2*** (0.3)
Observations	1421	2721	1472	1421	2721	1472
R-squared	0.818	0.829	0.832	0.748	0.745	0.664

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

Table 4: Examining Heterogeneities by School District Urbanicity

Panel A	<u>Instructional Exp. Per Pupil</u>			<u>Instructional Support Per Pupil</u>			<u>Student Services Per Pupil</u>		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
	FE	FE	FE	FE	FE	FE	FE	FE	FE
% Shift in 2008-09	-3.83***	-1.89***	-2.24**	-4.58	-2.3**	0.16***	-3.30	-2.00*	-0.98
% Shift in 2009-10	0.80	0.21	0.02	-2.88	-1.35	2.21	-1.18	0.94	2.00
Pre-Recession Base	8,210	7,820	7,511	2,181	1,954	1,640	1,832	1,641	1,351
Trend	245.1*** (19.7)	154.5*** (7.9)	183.6*** (9.5)	92.1*** (8.8)	69.7*** (3.1)	53.5*** (3.7)	85.7*** (8.0)	59.5*** (2.3)	47.0*** (3.0)
Recession	-314.5** (152.4)	-147.5*** (47.2)	-168.1** (67.3)	-99.8 (85.6)	-44.9** (21.7)	2.7 (32.2)	-60.5 (68.1)	-32.8* (17.0)	-13.3 (26.9)
Stimulus	380.5* (206.8)	164.1*** (58.2)	169.9* (86.8)	37.1 (108.3)	18.6 (30.3)	33.6 (40.3)	38.9 (87.1)	48.3** (22.7)	40.3 (35.3)
Observations	440	5041	1271	440	5041	1271	440	5041	1271
R-squared	0.797	0.591	0.821	0.828	0.679	0.756	0.84	0.719	0.774

Panel B	<u>Transportation Per Pupil</u>			<u>Student Activities Per Pupil</u>			<u>Utilities and Maintenance Per Pupil</u>		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
	FE	FE	FE	FE	FE	FE	FE	FE	FE
% Shift in 2008-09	-6.16	-4.48***	1.09	0.52	0.47	2.96	-1.70	-2.28***	-2.47
% Shift in 2009-10	-11.78***	-5.85***	-2.46	0.42	0.63	4.86	-4.51***	-4.35***	-4.71**
Pre-Recession Base	691	701	1,037	181	259	172	1,743	1,631	1,512
Trend	21.0*** (3.1)	14.4*** (1.3)	21.8*** (2.4)	5.6*** (0.8)	5.7*** (0.4)	2.7*** (0.6)	78.5*** (4.6)	45.8*** (2.1)	52.9*** (2.7)
Recession	-42.6 (26.7)	-31.4*** (10.8)	11.3 (19.2)	0.9 (6.5)	1.2 (2.9)	5.1 (5.8)	-29.7 (47.3)	-37.2*** (13.9)	-37.4 (23.1)
Stimulus	-38.9 (30.0)	-9.6 (14.9)	-36.8 (25.1)	-0.2 (9.1)	0.4 (3.7)	3.3 (7.1)	-48.9 (52.9)	-33.8* (17.5)	-33.8 (31.7)
Observations	440	5033	1271	432	5009	1244	440	5041	1271
R-squared	0.905	0.802	0.847	0.968	0.954	0.971	0.898	0.701	0.787

Panel C	<u>Median Teacher Salary</u>			<u>Median Teacher Years of Experience</u>		
	Urban	Suburban	Rural	Urban	Suburban	Rural
	FE	FE	FE	FE	FE	FE
% Shift in 2008-09	3.42**	1.51***	0.07	9.17**	10.32***	4.29**
% Shift in 2009-10	8.05***	7.13***	3.33***	17.43***	18.58***	7.72***
Pre-Recession Base	58,634	57,838	56,291	10.90	9.69	11.66
Trend	-446.8** (179.7)	-476.8*** (48.8)	-108.3* (65.3)	-0.4*** (0.1)	-0.5*** (0.0)	-0.3*** (0.0)
Recession	2005.5** (823.6)	873.6*** (253.6)	40.6 (447.6)	1.0** (0.4)	1.0*** (0.1)	0.5** (0.3)
Stimulus	2712.8*** (987.9)	3250.6*** (296.5)	1834.1*** (547.8)	0.9* (0.5)	0.8*** (0.1)	0.4 (0.3)
Observations	366	4192	1056	366	4192	1056
R-squared	0.882	0.795	0.853	0.728	0.699	0.741

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

Table 5: Examining Heterogeneities by Metropolitan Area

Panel A				Instructional Exp. Per Pupil				Instructional Support Per Pupil				Student Services Per Pupil			
	Camden FE	Edison FE	Newark FE	Wayne FE	Camden FE	Edison FE	Newark FE	Wayne FE	Camden FE	Edison FE	Newark FE	Wayne FE			
% Shift in 2008-09	-2.58***	-1.56	-2.46***	-1.22	-1.99	0.90	-1.48	-3.87	-3.17	1.39	-1.26	-3.38			
% Shift in 2009-10	0.43	1.30	0.24	0.16	-1.85	4.30	0.89	-4.95	-2.10	5.55*	3.09*	-1.20			
Pre-Recession Base	7,314	7,783	7,974	7,862	1,757	1,868	1,998	2,031	1,464	1,594	1,692	1,676			
Trend	176.2*** (11.1)	185.7*** (18.3)	146.4*** (8.8)	79.1*** (9.4)	68.5*** (4.4)	68.5*** (6.2)	67.1*** (3.6)	59.3*** (7.2)	58.7*** (3.5)	63.1*** (5.0)	56.7*** (3.1)	53.8*** (4.8)			
Recession	-189.0*** (67.7)	-121.8 (104.2)	-196.2*** (65.6)	-96.1 (70.1)	-35 (36.2)	16.9 (39.8)	-29.5 (33.4)	-78.6* (44.0)	-46.4 (28.4)	22.2 (36.2)	-21.3 (27.8)	-56.6 (36.2)			
Stimulus	220.6** (88.2)	223.0* (128.8)	214.9** (84.6)	108.9 (82.8)	2.6 (41.9)	63.4 (56.4)	47.4 (42.1)	-22.1 (72.1)	15.7 (32.9)	66.3 (49.5)	73.5** (36.9)	36.5 (42.8)			
Observations	1252	1424	1605	1260	1252	1424	1605	1260	1252	1424	1605	1260			
R-squared	0.784	0.368	0.783	0.842	0.752	0.518	0.776	0.8	0.768	0.577	0.79	0.836			

Panel B				Transportation Per Pupil				Student Activities Per Pupil				Utilities and Maintenance Per Pupil			
	Camden FE	Edison FE	Newark FE	Wayne FE	Camden FE	Edison FE	Newark FE	Wayne FE	Camden FE	Edison FE	Newark FE	Wayne FE			
% Shift in 2008-09	-6.42***	-4.35**	-1.06	-2.83	1.38	-0.60	-0.23	2.72	-2.16	-0.17	-2.69**	-2.41			
% Shift in 2009-10	-9.2***	-7.47***	-4.27**	-3.95	0.75	1.56	0.76	0.16	-4.50***	-2.22	-5.48***	-4.86***			
Pre-Recession Base	726	811	822	612	223	253	264	269	1,540	1,659	1,616	1,616			
Trend	23.8*** (2.3)	15.5*** (2.2)	11.8*** (2.0)	4.2 (3.3)	4.6*** (0.7)	6.2*** (0.7)	4.5*** (0.7)	5.1*** (0.7)	49.9*** (3.2)	55.6*** (4.7)	43.3*** (2.6)	34.0*** (3.2)			
Recession	-46.6*** (15.0)	-35.3** (17.8)	-8.8 (13.6)	-17.4 (30.4)	3.1 (5.3)	-1.5 (5.7)	-0.6 (5.9)	7.3 (5.2)	-33.2 (22.3)	-2.9 (29.2)	-43.5** (21.4)	-39.0* (23.1)			
Stimulus	-20.1 (18.8)	-25.3 (21.1)	-26.4 (16.8)	-6.8 (35.4)	-1.4 (6.6)	5.5 (7.5)	2.6 (6.9)	-6.9 (6.1)	-36.1 (27.3)	-33.9 (37.1)	-45.1* (26.8)	-39.5 (30.4)			
Observations	1252	1424	1597	1260	1229	1412	1595	1259	1252	1424	1605	1260			
R-squared	0.897	0.777	0.916	0.738	0.959	0.946	0.962	0.971	0.849	0.482	0.813	0.899			

Panel C				Median Teacher Salary				Median Teacher Years of Experience			
	Camden FE	Edison FE	Newark FE	Wayne FE	Camden FE	Edison FE	Newark FE	Wayne FE			
% Shift in 2008-09	0.02	1.87**	1.89***	2.87***	3.62	11.78***	12.51***	13.11***			
% Shift in 2009-10	4.27***	7.64***	7.76***	9.47***	7.24***	22.48***	21.9***	25.14***			
Pre-Recession Base	56,138	55,400	58,511	60,527	11.05	9.34	9.59	9.15			
Trend	-66.3 (74.3)	-493.4*** (79.1)	-607.1*** (76.0)	-1087.2*** (105.8)	-0.3*** (0.0)	-0.5*** (0.0)	-0.5*** (0.0)	-0.7*** (0.0)			
Recession	11.7 (436.7)	1037.6** (471.4)	1106.8*** (427.6)	1734.9*** (560.0)	0.4 (0.3)	1.1*** (0.2)	1.2*** (0.2)	1.2*** (0.2)			
Stimulus	2383.8*** (530.4)	3195.2*** (559.4)	3430.8*** (504.9)	3995.3*** (617.4)	0.4 (0.3)	1.0*** (0.3)	0.9*** (0.2)	1.1*** (0.3)			
Observations	1042	1181	1335	1047							
R-squared	0.809	0.788	0.813	0.812	0.718	0.692	0.694	0.698			

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

Table 6: Examining Heterogeneities by Legal Designation

Panel A	<u>Total Expenditure Per Pupil</u>			<u>Total Revenue Per Pupil</u>			<u>Federal Aid Per Pupil</u>		
	Abbott FE	Bacon FE	High Poverty FE	Abbott FE	Bacon FE	High Poverty FE	Abbott FE	Bacon FE	High Poverty FE
% Shift in 2008-09	-8.77***	-0.62	-6.23***	-7.19**	-0.34	-5.19***	-15.68***	-18.36	-16.85***
% Shift in 2009-10	-11.0***	4.70	-5.81***	-9.82***	5.71	-5.65***	1.29	15.86	5.37
Pre-Recession Base	23,342	18,570	21,014	25,315	22,969	24,486	1,145	971	994
Trend	903.5*** (74.5)	413.2*** (97.5)	696.8*** (46.4)	880.4*** (91.7)	647.4*** (142.1)	842.3*** (67.3)	51.2*** (6.1)	53.9*** (13.9)	24.1*** (7.5)
Recession	-2047.4*** (669.3)	-114.4 (971.3)	-1308.9*** (313.0)	-1820.1** (714.2)	-78.3 (1830.1)	-1270.0*** (421.5)	-179.6*** (37.7)	-178.3 (111.1)	-167.6*** (52.6)
Stimulus	-519.8 (740.8)	987.2 (2149.6)	88.4 (374.0)	-666.7 (756.7)	1390.1 (2941.5)	-113.8 (500.2)	194.3*** (51.2)	332.4** (130.4)	220.9*** (51.4)
Observations	371	191	1711	371	191	1711	371	191	1711
R-squared	0.772	0.51	0.54	0.703	0.458	0.598	0.831	0.795	0.81

Panel B	<u>State Aid Per Pupil</u>			<u>Local Revenue Per Pupil</u>			<u>Property Taxes Per Pupil</u>		
	Abbott FE	Bacon FE	High Poverty FE	Abbott FE	Bacon FE	High Poverty FE	Abbott FE	Bacon FE	High Poverty FE
% Shift in 2008-09	-8.13***	2.24	-3.04**	8.04*	-5.69*	-2.81	8.26*	-8.07***	-2.67
% Shift in 2009-10	-26.53***	-16.26***	-23.21***	9.71**	-8.36**	-4.1*	9.96**	-10.57***	-3.36
Pre-Recession Base	14,995	8,768	9,143	3,112	5,956	7,518	3,033	5,707	7,215
Trend	702.4*** (48.9)	73.7*** (26.9)	324.2*** (19.2)	28.1 (23.2)	131.4*** (28.3)	261.3*** (26.4)	32.2 (23.8)	126.7*** (19.8)	269.9*** (26.6)
Recession	-1218.8*** (369.1)	196.6 (246.6)	-277.8** (139.9)	250.2* (137.5)	-338.8* (202.9)	-211.3 (141.2)	250.5* (141.3)	-460.4*** (158.6)	-192.7 (141.4)
Stimulus	-2759.5*** (436.2)	-1622.4*** (269.9)	-1844.2*** (157.0)	51.9 (162.0)	-159 (191.0)	-96.8 (150.3)	51.4 (167.1)	-143 (200.1)	-49.6 (147.8)
Observations	371	191	1711	371	191	1711	371	190	1621
R-squared	0.898	0.973	0.886	0.976	0.967	0.721	0.975	0.977	0.729

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

Table 7: Examining Heterogeneities by District Legal Designation (cont.)

Panel A	<u>Instructional Exp. Per Pupil</u>			<u>Instructional Support Per Pupil</u>			<u>Student Services Per Pupil</u>		
	Abbott	Bacon	High Poverty	Abbott	Bacon	High Poverty	Abbott	Bacon	High Poverty
	FE	FE	FE	FE	FE	FE	FE	FE	FE
% Shift in 2008-09	-7.12***	-1.31	-3.24***	-15.77***	-3.29	-5.25**	-11.17***	-5.31	-4.69**
% Shift in 2009-10	-9.56***	3.91***	-1.91	-25.59***	2.93	-7.78***	-16.43***	2.42	-5.04**
Pre-Recession Base	9,311	6,956	8,035	3,076	1,691	2,112	2,591	1,425	1,733
Trend	251.9*** (27.9)	124.8*** (14.2)	228.5*** (14.8)	171.2*** (23.2)	42.4*** (7.1)	100.6*** (7.5)	162.5*** (10.5)	49.9*** (7.3)	88.1*** (5.0)
Recession	-662.5*** (184.4)	-90.9 (160.2)	-260.7*** (90.8)	-485.2*** (127.8)	-55.6 (71.7)	-110.9** (45.1)	-289.5*** (90.9)	-75.7 (67.9)	-81.3** (34.2)
Stimulus	-227.2 (192.7)	362.9* (185.3)	107.3 (97.4)	-302.1 (223.9)	105.1 (91.9)	-53.5 (58.1)	-136.2 (107.7)	110.1 (84.1)	-6.1 (36.4)
Observations	371	191	1711	371	191	1711	371	191	1711
R-squared	0.71	0.741	0.444	0.643	0.774	0.634	0.806	0.741	0.693

Panel B	<u>Transportation Per Pupil</u>			<u>Student Activities Per Pupil</u>			<u>Utilities and Maintenance Per Pupil</u>		
	Abbott	Bacon	High Poverty	Abbott	Bacon	High Poverty	Abbott	Bacon	High Poverty
	FE	FE	FE	FE	FE	FE	FE	FE	FE
% Shift in 2008-09	-10.69***	-1.92	-6.20***	0.79	-2.75	0.81	-0.35	-4.08*	-2.32
% Shift in 2009-10	-15.85***	-5.91	-10.0***	2.49	5.97	2.92	-3.93	-6.33**	-5.26***
Pre-Recession Base	673	948	742	217	157	196	2,004	1,379	1,723
Trend	24.4*** (2.4)	1.7 (4.7)	28.9*** (2.7)	4.6*** (1.4)	3.6*** (1.0)	4.6*** (0.5)	77.8*** (6.9)	48.8*** (3.7)	64.7*** (3.9)
Recession	-71.9*** (22.0)	-18.2 (39.5)	-46.0*** (17.4)	1.7 (9.9)	-4.3 (10.0)	1.6 (4.3)	-7 (57.4)	-56.2* (32.4)	-39.9 (25.1)
Stimulus	-34.7 (28.2)	-37.8 (49.3)	-28.2 (18.7)	3.7 (11.9)	13.6 (13.5)	4.1 (5.0)	-71.8 (70.7)	-31.1 (36.5)	-50.8* (26.7)
Observations	371	191	1711	371	188	1686	371	191	1711
R-squared	0.83	0.934	0.822	0.895	0.964	0.934	0.861	0.867	0.667

Panel C	<u>Median Teacher Salary</u>			<u>Median Teacher Years of Experience</u>		
	Abbott	Bacon	High Poverty	Abbott	Bacon	High Poverty
	FE	FE	FE	FE	FE	FE
% Shift in 2008-09	1.78	1.33	0.62	17.84***	7.66	7.81***
% Shift in 2009-10	7.16***	6.17**	5.23***	33.44***	21.07***	14.65***
Pre-Recession Base	60,855	53,560	57,374	8.97	10.44	10.24
Trend	-513.4*** (148.5)	-447.3* (251.2)	-77.4 (87.2)	-0.9*** (0.1)	-0.4*** (0.1)	-0.3*** (0.0)
Recession	1082.4 (853.6)	710.1 (1200.4)	358.3 (427.4)	1.6*** (0.4)	0.8 (0.6)	0.8*** (0.2)
Stimulus	3275.1*** (919.3)	2593.3** (1275.1)	2644.5*** (431.2)	1.4*** (0.5)	1.4* (0.8)	0.7*** (0.2)
Observations	310	160	1421	310	160	1421
R-squared	0.897	0.654	0.818	0.811	0.779	0.748

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

Figure 1A: Examining the Trends in School Revenues and Expenditures for New Jersey during the Great Recession

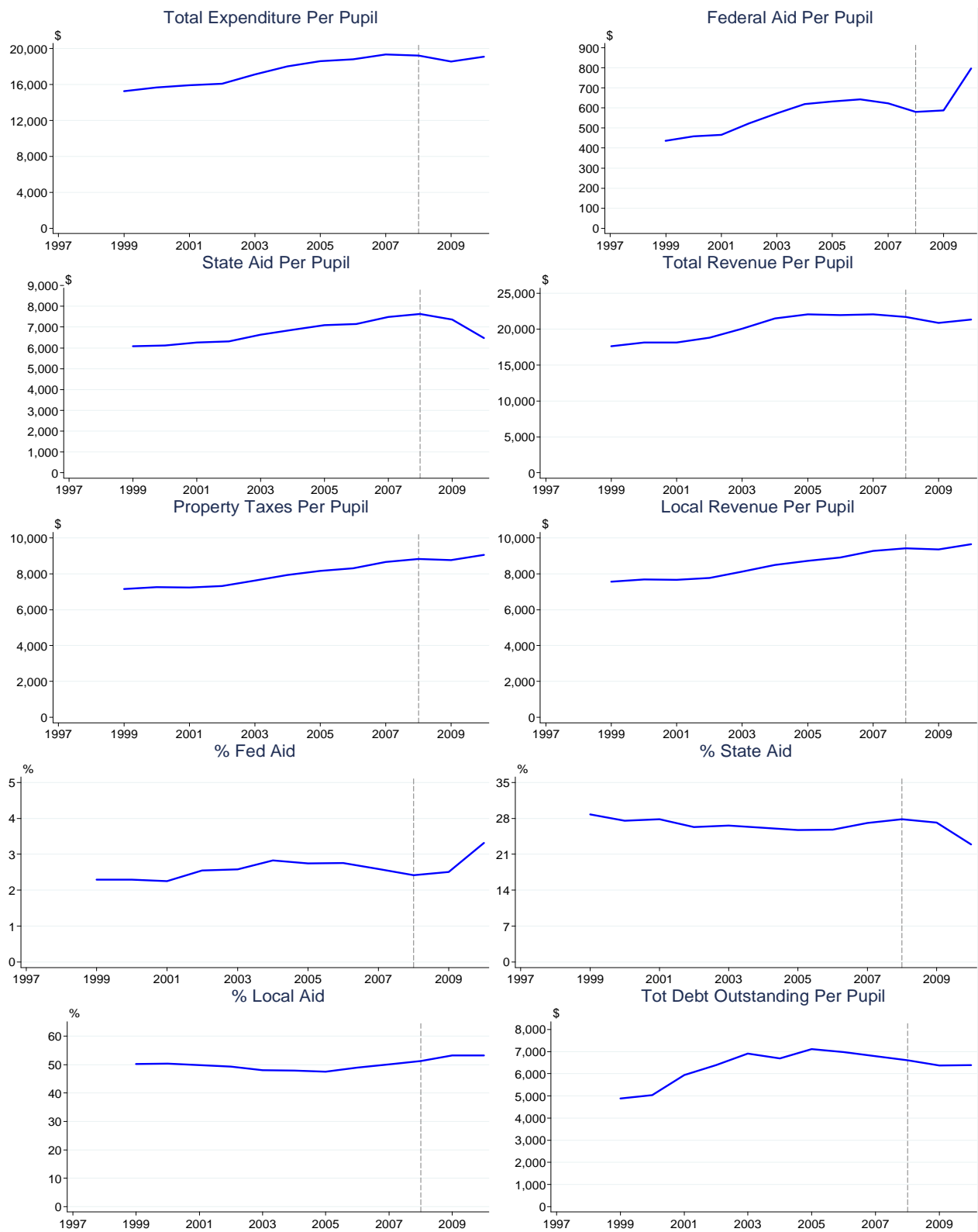


Figure 1B: Examining the Trends in the Composition of School Expenditures for New Jersey during the Great Recession

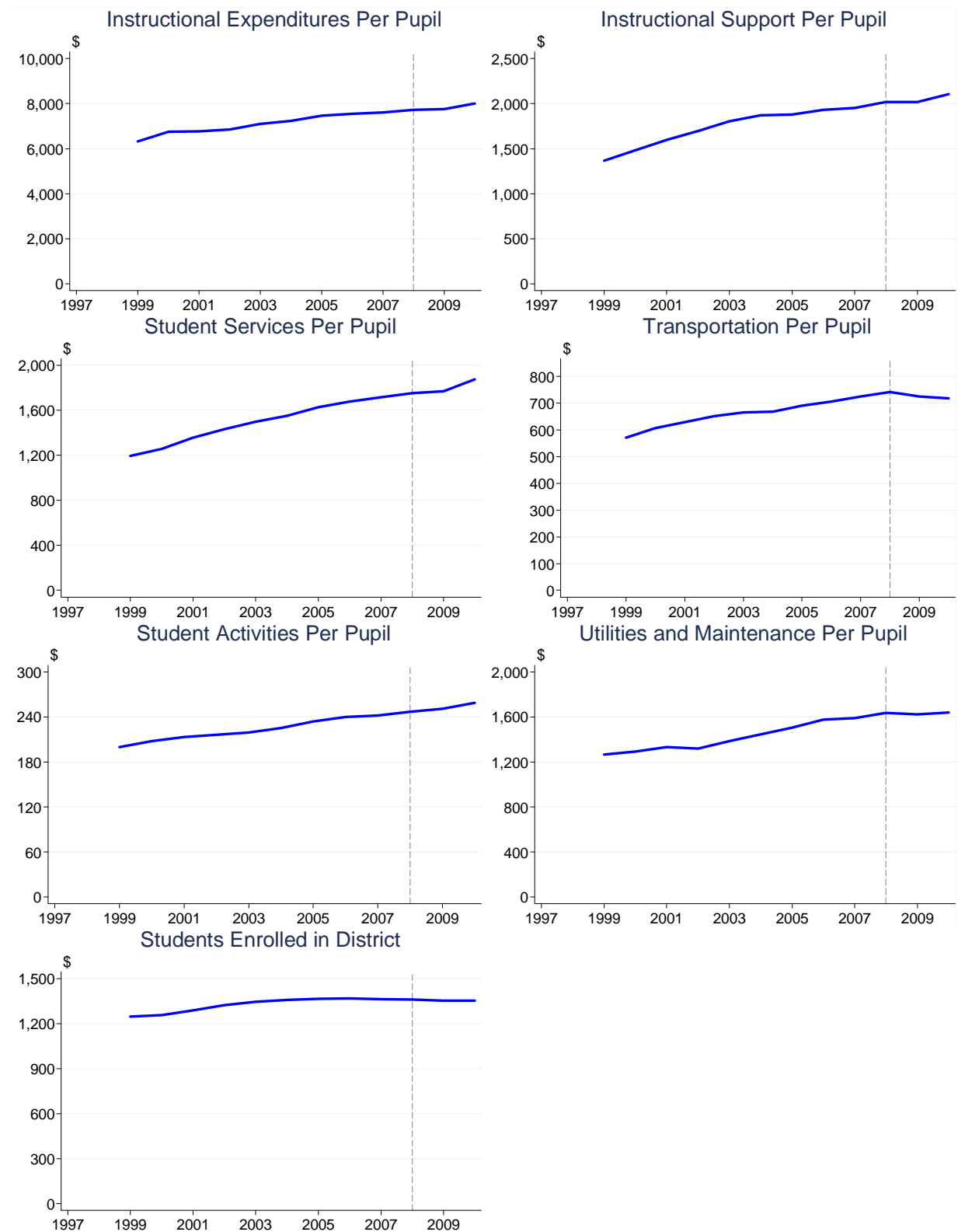


Figure 2: Percent of District Revenue from Federal Sources

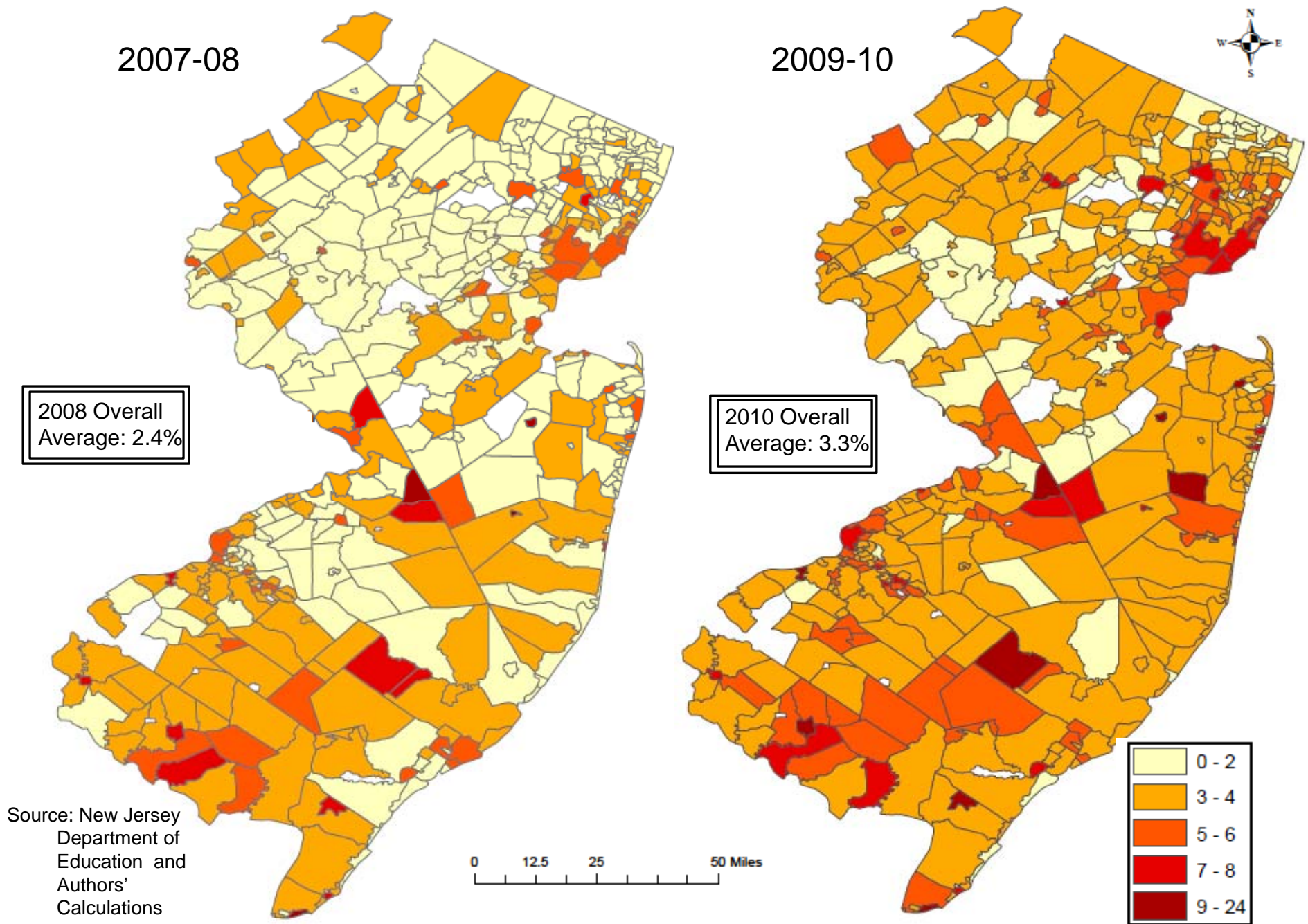


Figure 3: Examining Patterns in Revenues and Expenditures During the Financial Crisis and Federal Stimulus Period



Figure 4: Examining Heterogeneities by School District Poverty Status

■ % Shift in 2008-09 ■ % Shift in 2009-10

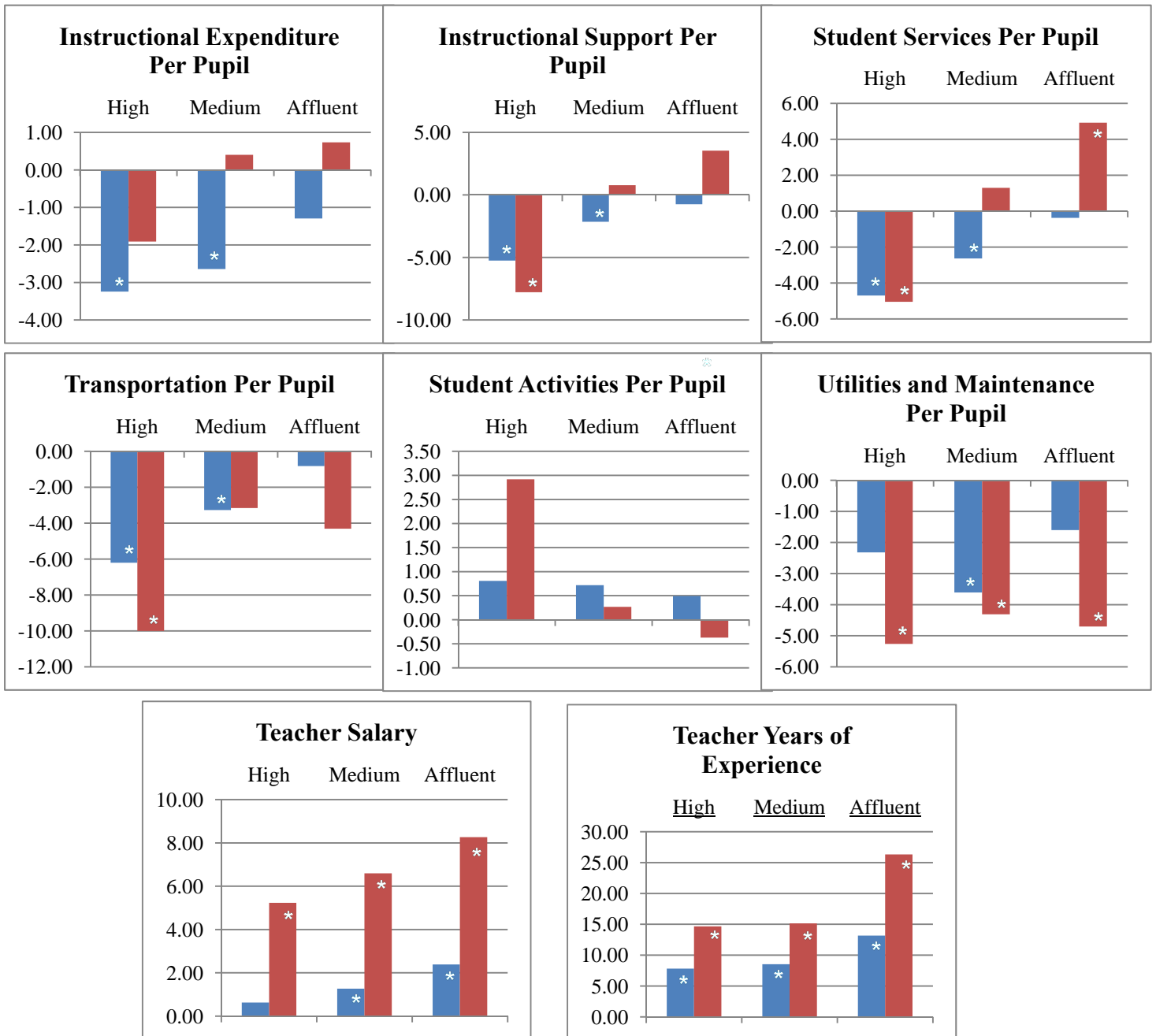


Figure 5: Examining Heterogeneities by Urban Status

■ % Shift in 2008-09 ■ % Shift in 2009-10

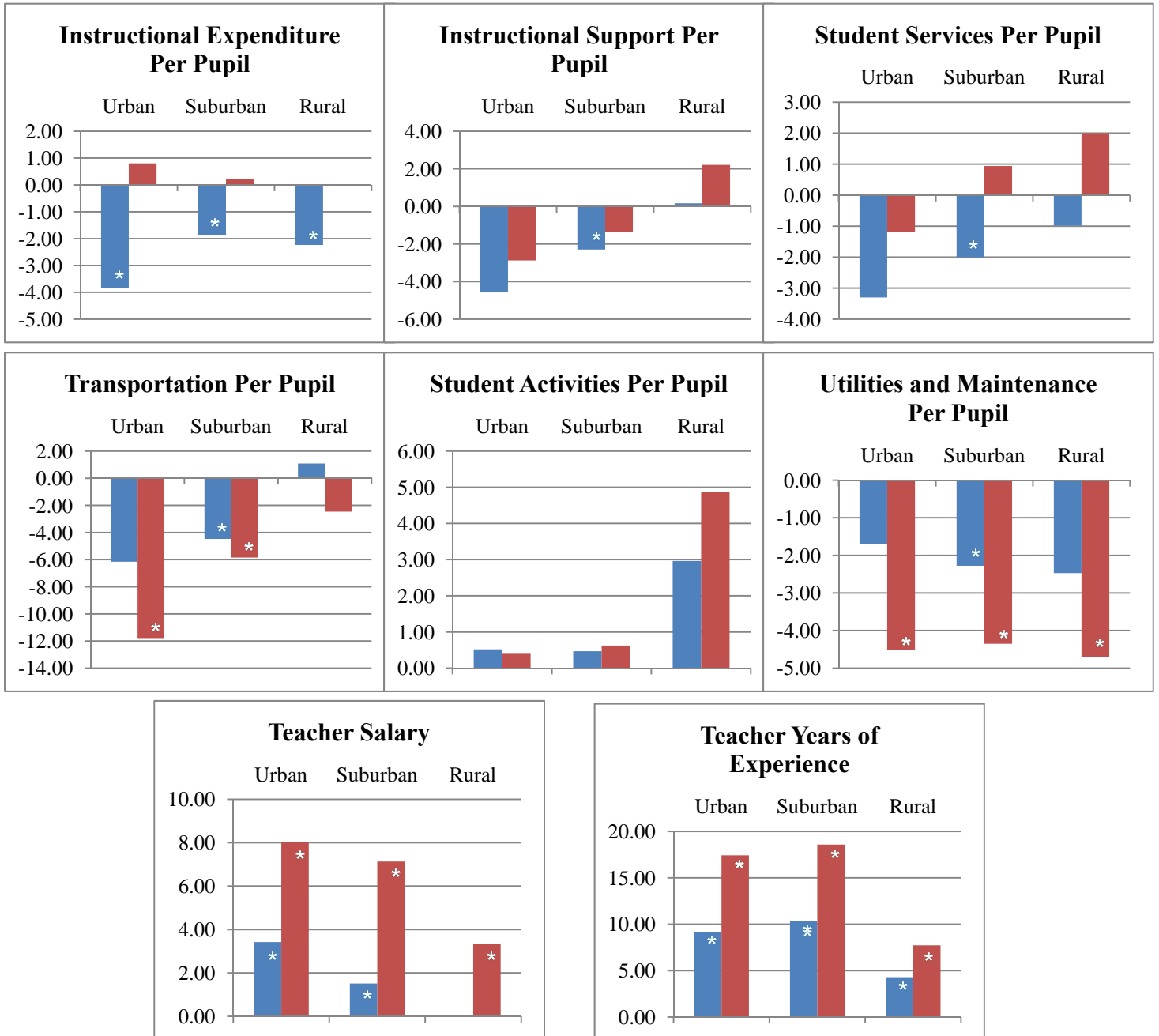


Figure 6: Examining Heterogeneities by Metropolitan Division

■ % Shift in 2008-09 ■ % Shift in 2009-10

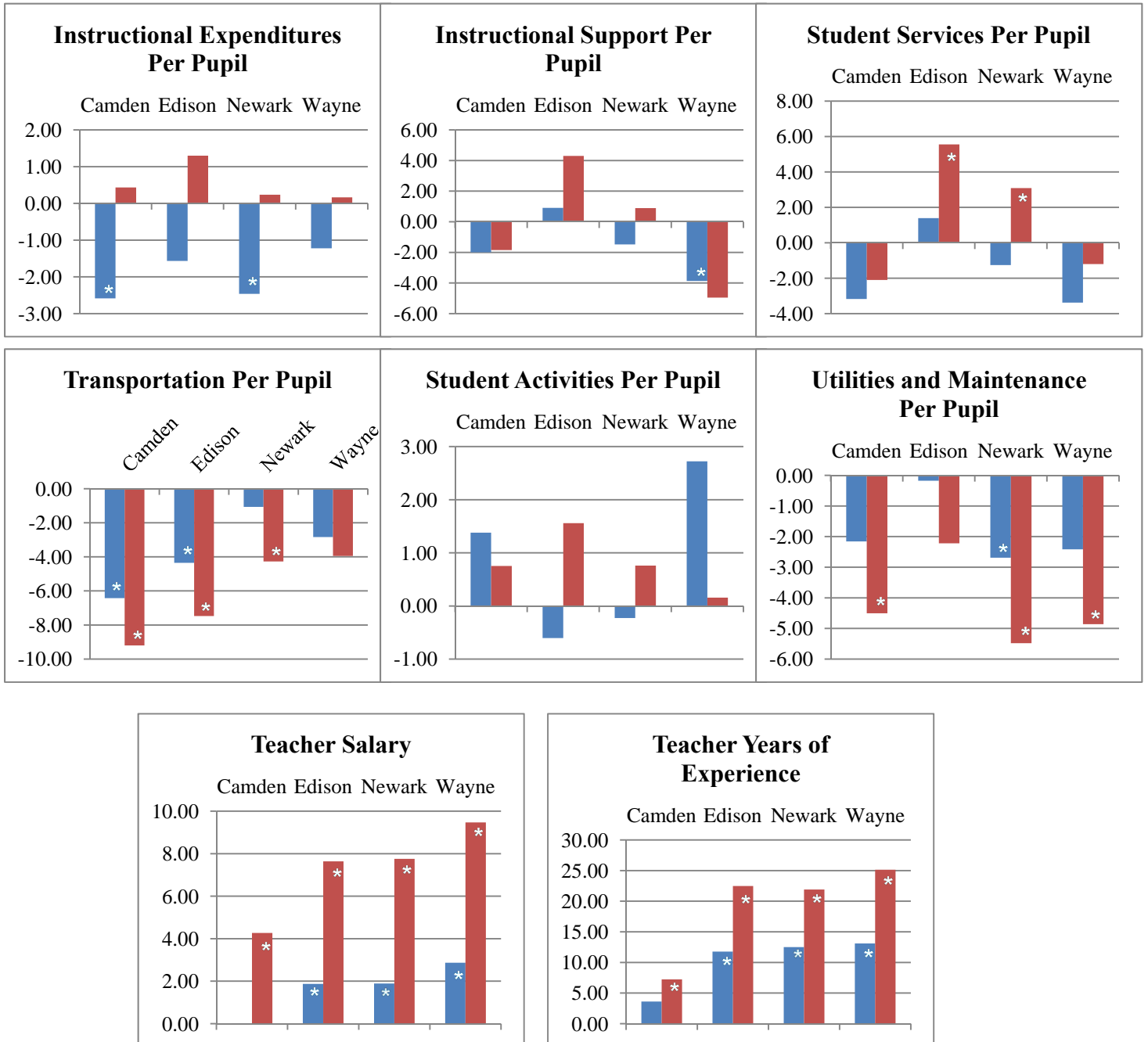
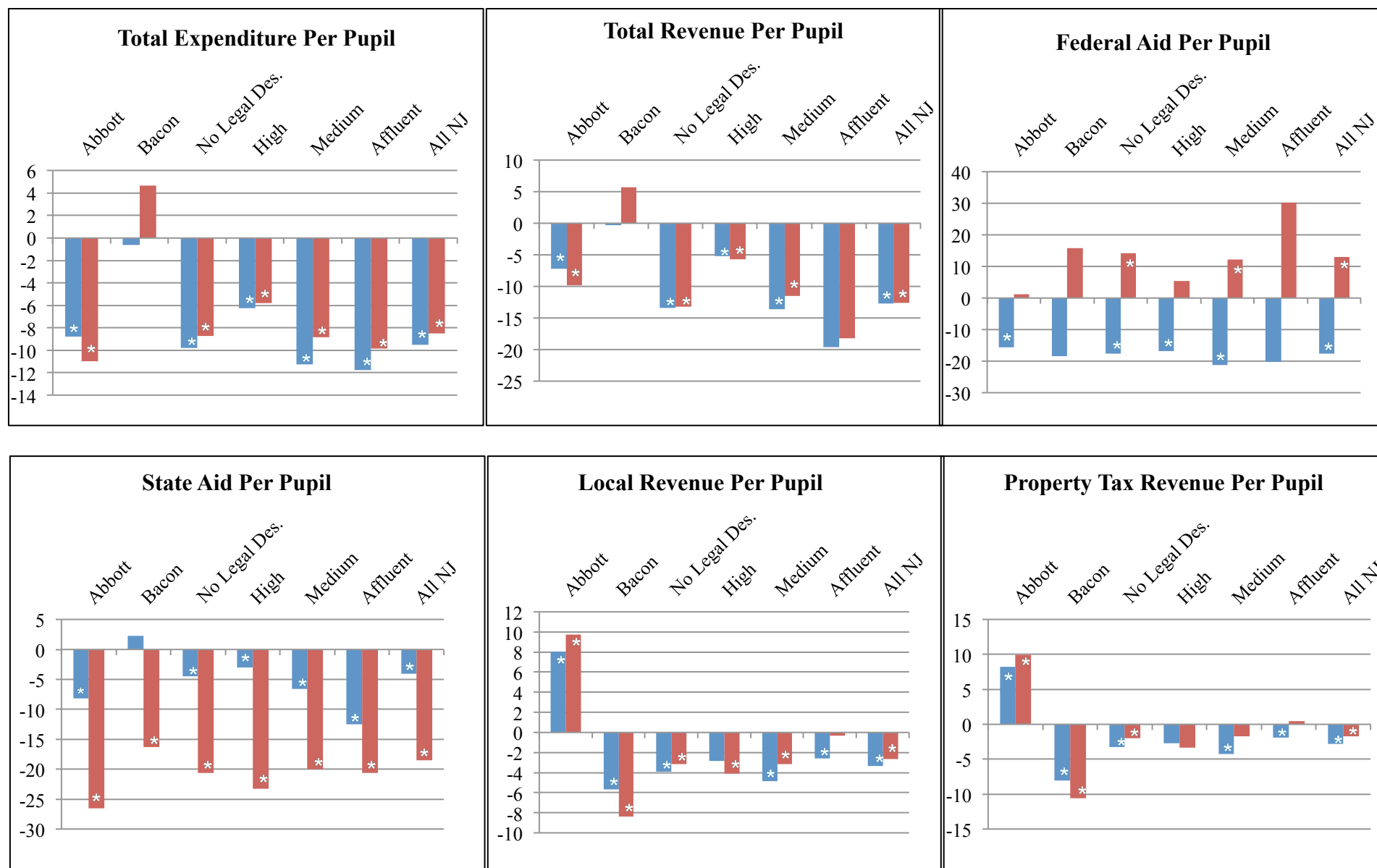


Figure 7A: Examining Heterogeneities by Legal Designation

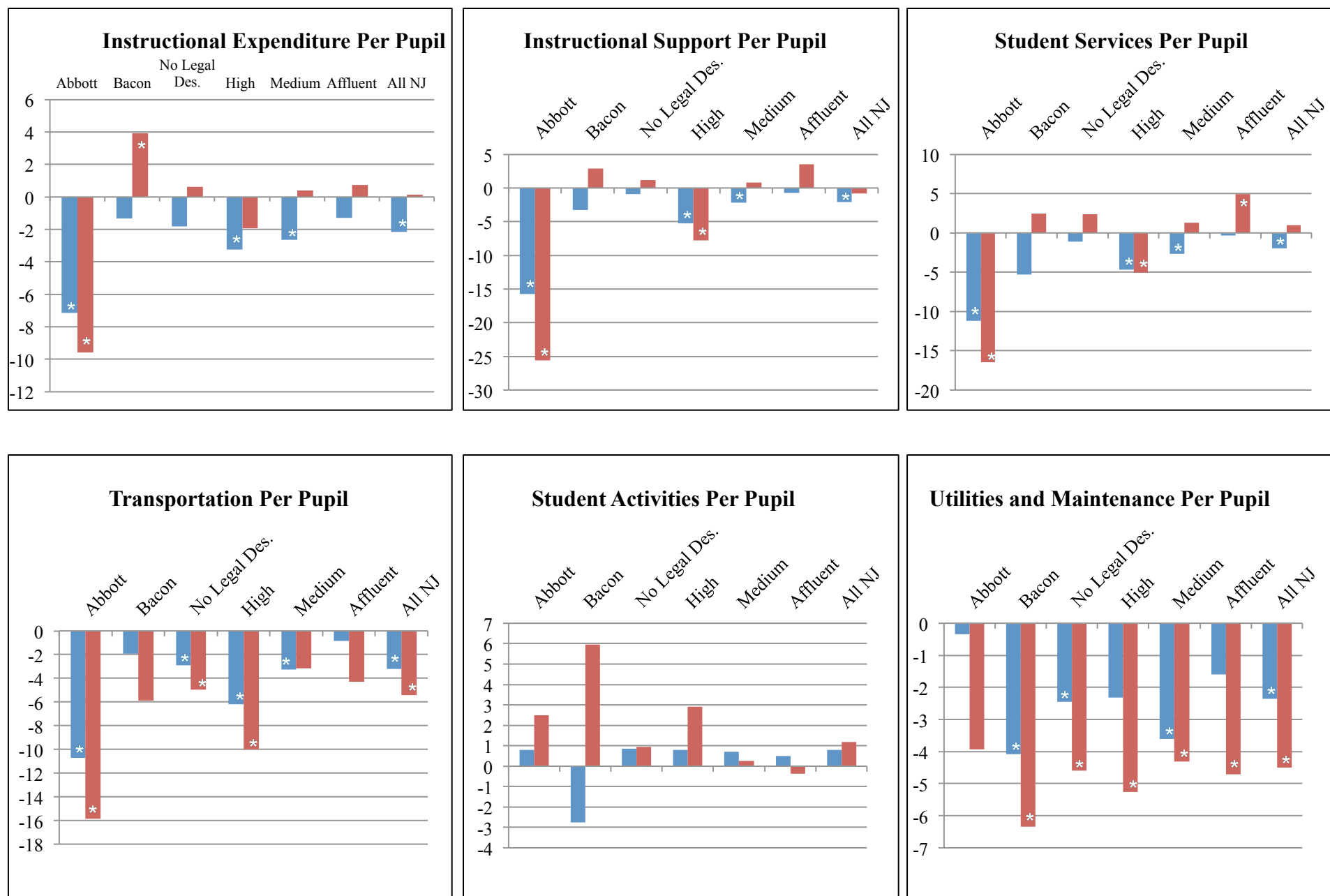
■ % Shift in 2008-09 ■ % Shift in 2009-10



Note: "No Legal Des." constitutes any district that is not classified as either Abbott or Bacon.

Figure 7B: Examining Heterogeneities by Legal Designation (continued)

■ % Shift in 2008-09 ■ % Shift in 2009-10



Note: "No Legal Des." constitutes any district that is not classified as either Abbott or Bacon.

Figure 7C: Examining Heterogeneities by Legal Designation (continued)

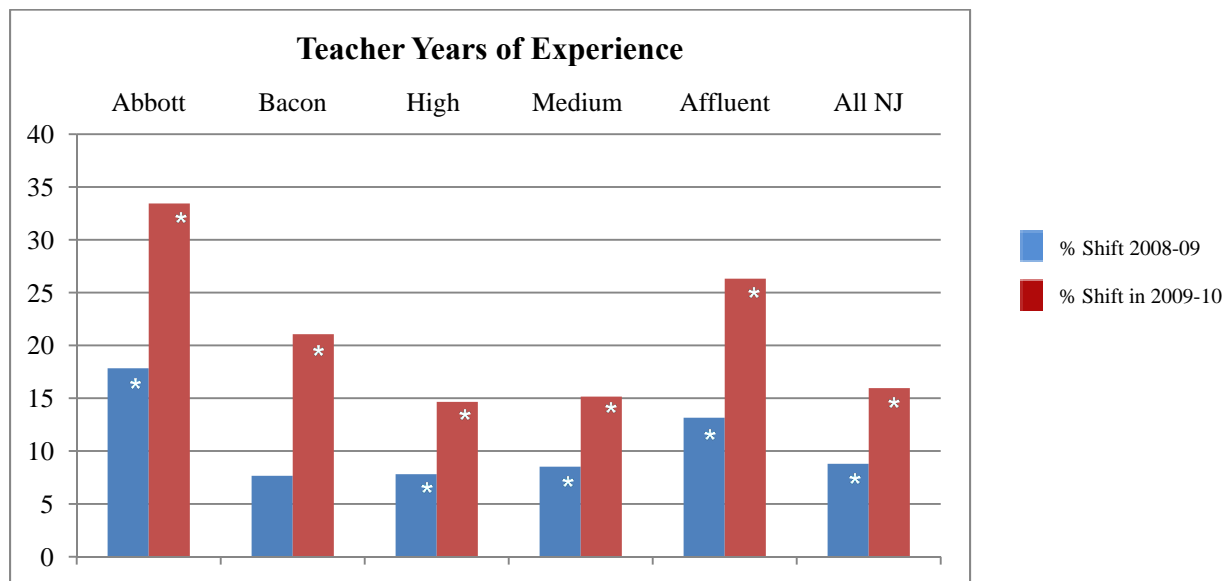
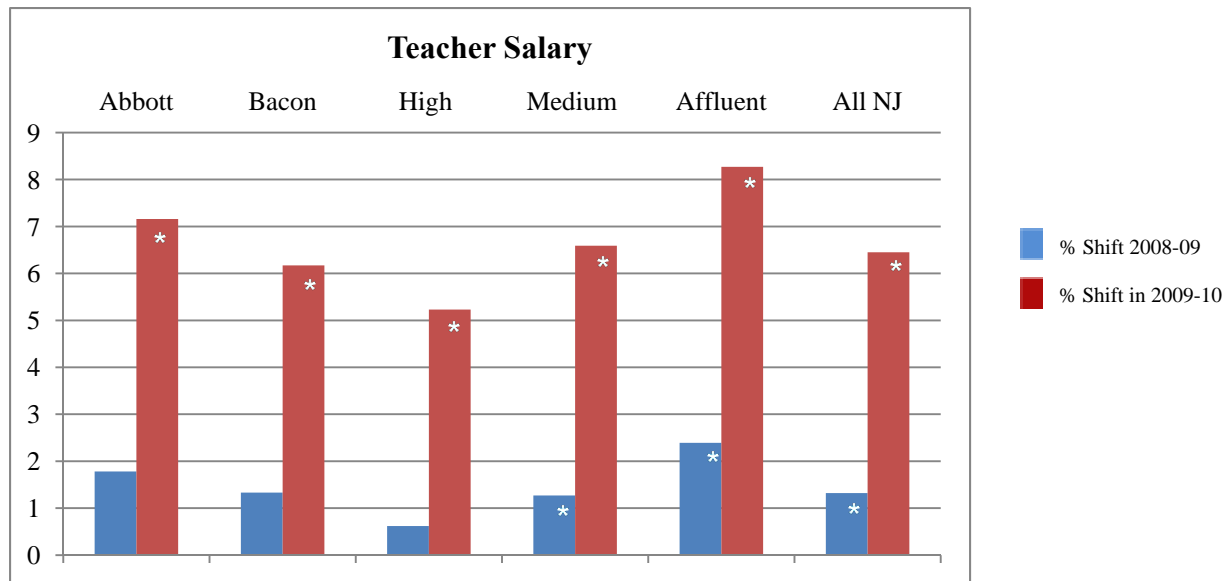


Figure 8: Total Revenue Per Pupil: Budget vs. Actual

\$ Inflation Adjusted

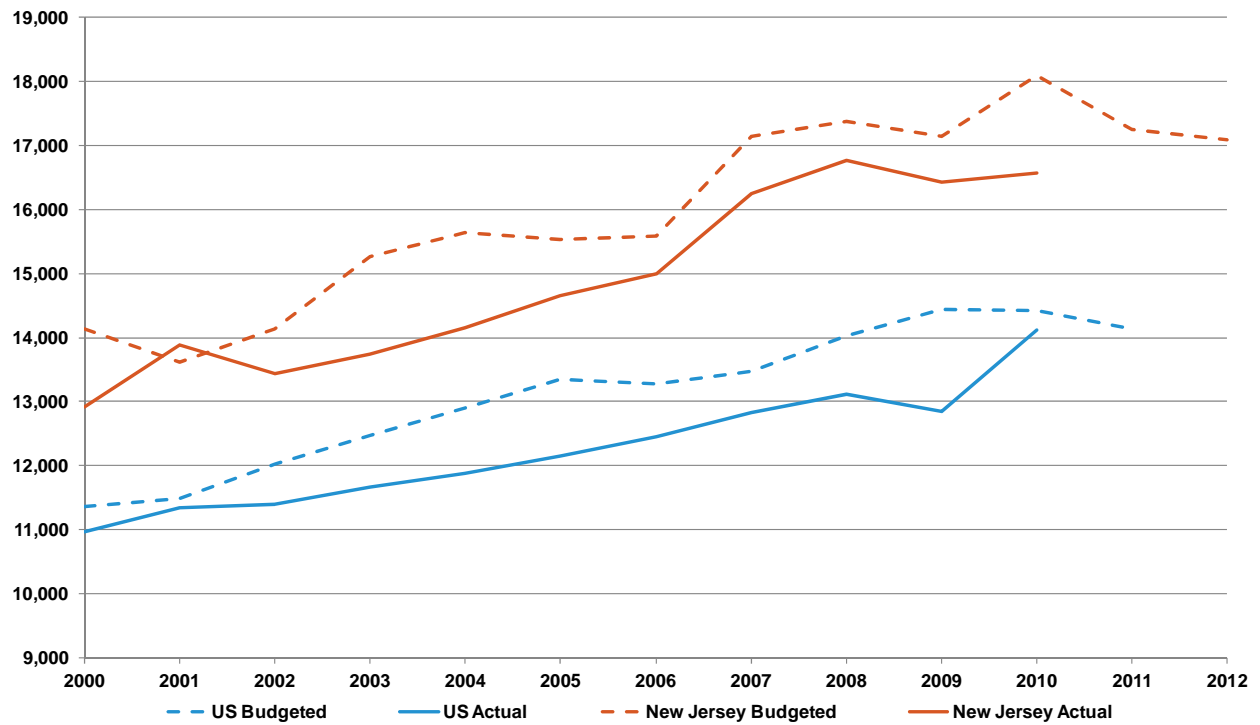


Table A1: Examining Patterns in Years of Experience during the Financial Crisis and Fiscal Stimulus Period

	(1) Median Teacher Years of Experience FE	(2) Median Administrator Years of Experience FE
% Shift in 2008-09	8.80***	0.09
% Shift in 2009-10	15.96***	1.91
Pre-Recession Base	10.13	20.57
Trend	-0.42***	-0.45***
Recession	0.89***	-0.02
Stimulus	0.73***	0.41
Observations	5,614	5,605
R2	0.72	0.593

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

Table A2: Definitions for Expenditure Components

Instructional Expenditures

All expenditure associated with direct classroom instruction. Teacher Salaries and benefits; classroom supplies.

Instructional Support

All support service expenditures designed to assess and improve students' well-being. Food services, educational television, library, and computer costs.

Student Services

Psychological and health services; school store.

Utilities and Maintenance

Heating, lighting, water, and sewage; operation and maintenance.

Transportation

Total expenditure on student transportation services.

Other

Other includes small components of support services, enterprise operations, and NCES defined category entitled "other else".

Figure A1: Breakdown of Expenditure Components in 2007-08 School Year

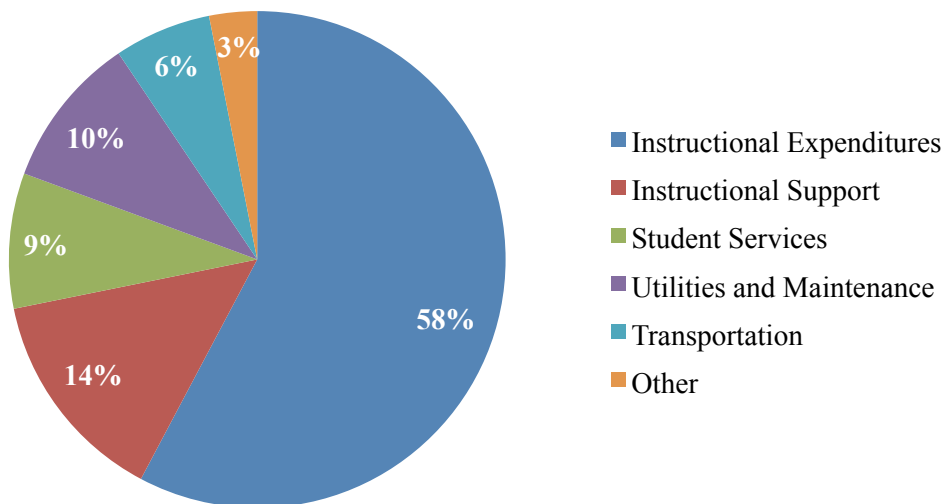
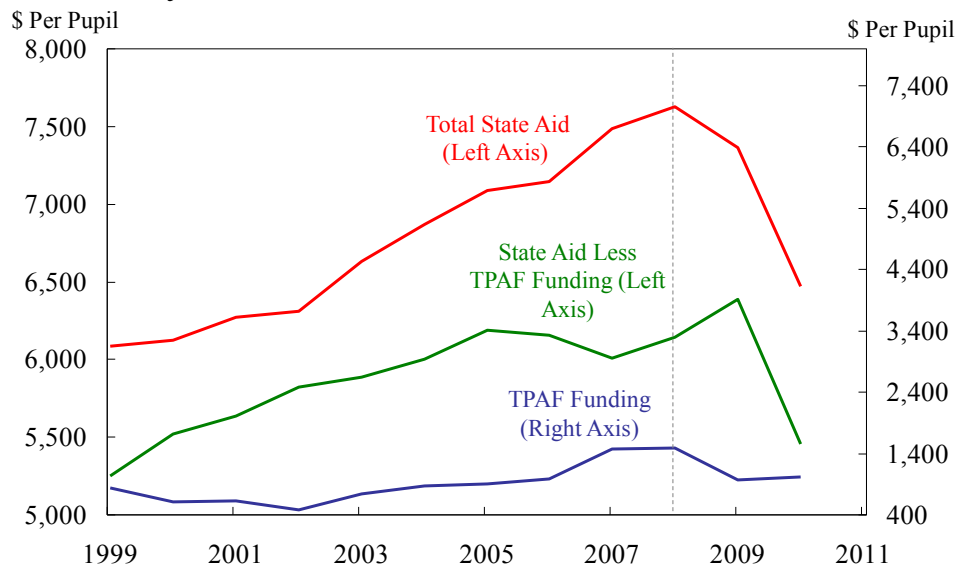


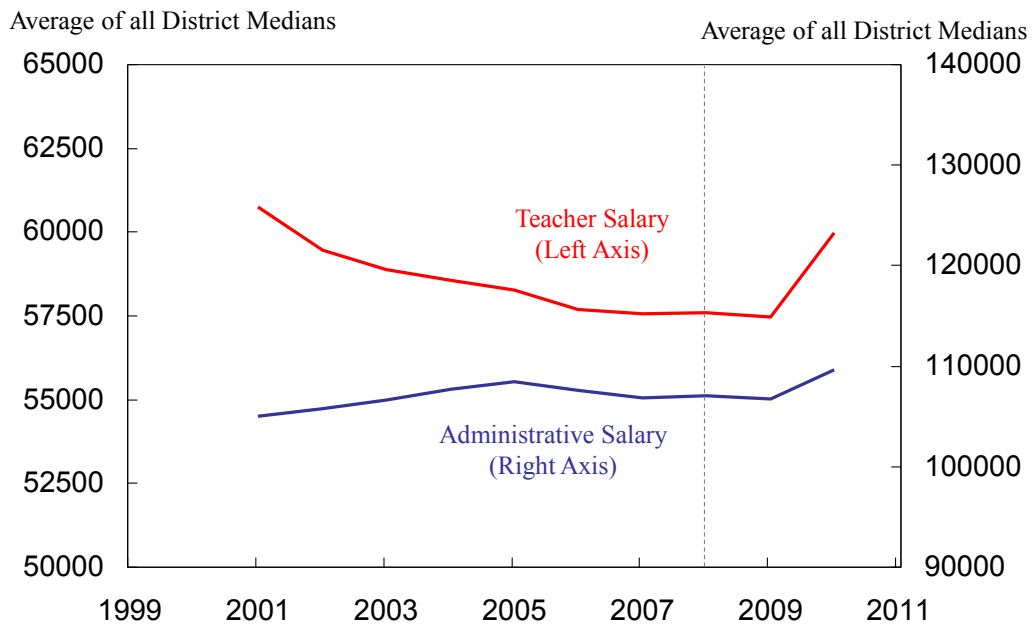
Figure A2: Trends in Total State Aid and State Aid to Pension Funds

New Jersey State Aid



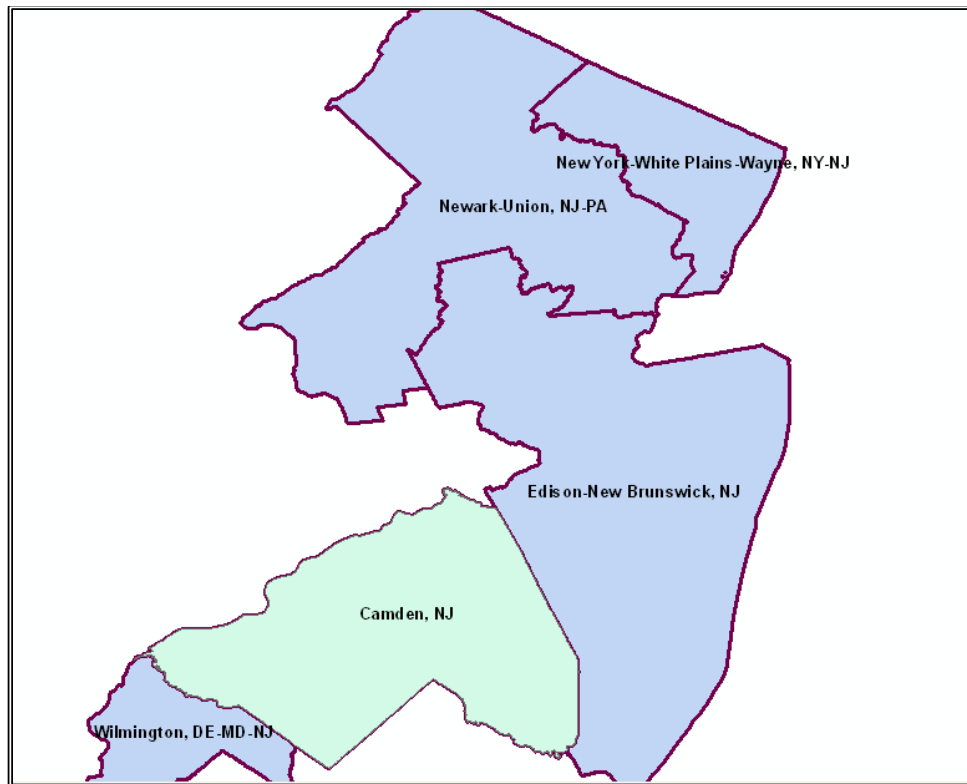
Note: Years represent spring term.

Figure A3: CPI Adjusted Salary for Teachers and Administrators



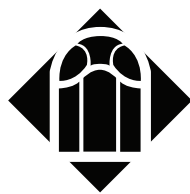
Note: Years represent spring term.

Figure A4: New Jersey Metro Areas





NEW YORK UNIVERSITY



I N S T I T U T E F O R
Education and Social Policy

The Institute for Education and Social Policy is a joint research center of NYU's Wagner and Steinhardt Schools. Founded in 1995, IESP brings the talents of a diverse group of NYU faculty, graduate students and research scientists to bear on questions of education and social policy. We are one of the nation's leading academic research centers addressing urban education issues and a substantial amount of our work focuses on New York City public schools and students. More information is available on our website at <http://steinhardt.nyu.edu/iesp>.