

# Private school choice in the wake of the Great Recession

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## Abstract

The Great Recession (GR) decreased the economic resources of families and federal, state, and local governments, and consequently, decreased public K-12 school budgets. While several studies have explored the effects of the recession on college enrollment choices, to our knowledge, none have examined how the GR affected K-12 school choices for American families. Using nationally representative data on individual students in grades K-12 from the Current Population Survey, we examine how the Great Recession affected parents' choices about whether to send their children to private schools, and whether these choices differed by family income and geographic location. We employ a difference-in-differences methodology, comparing differences in private school enrollment prior to and after the recession among students in metropolitan areas that were more or less severely affected by the recession, as measured by changes in the unemployment rate. Among all students enrolled in primary and secondary education, we find that the recession decreased private school enrollment by approximately one-third, and by 2013, the private school enrollment rate in the most severely affected metropolitan areas had not returned to its pre-recession trend.

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# 1. Introduction

In the wake of the Great Recession (GR), news outlets documented an exodus of students from wealthy, expensive private schools to more racially and socioeconomically diverse local public schools (Birnbaum, 2009; Mieszkowski, 2010). Anecdotal accounts describe the pleasant surprise of a family in Brooklyn at the high quality of the public school offerings. Other testimonies from parents in Washington, DC, suggest that while they still preferred their former private schools, the financial pressures induced by the recession simply outweighed the benefits.

While many studies have explored the effects of the GR on postsecondary education and the effects on public school finances, no studies have considered its effects on the private school sector, or the distribution of elementary and secondary students across school sectors. If the GR did prompt families to reevaluate their school choice options, it could have important implications for students in both sectors, although the net impact on students could be positive or negative. Private school students are positively selected, and tend to have higher average income and achievement (Chakrabarti & Roy, 2016; Epple & Romano, 1998). If private school students switched to more racially and socioeconomically diverse schools, they could have positive effects on their public school peers, and their families could bring their social capital with them. On the other hand, public schools also faced financial pressures in the wake of the recession. An influx of students could mean a decrease in per-pupil expenditure, and depending on which schools saw the influx, could potentially limit opportunities for students who were in the public school districts prior to the recession, particularly if private school students are more likely to opt for public schools of choice, such as charter or magnet schools.

In this paper, using nationally representative data on individual students in grades K-12 from the Current Population Survey, we examine how the Great Recession affected families'

choices about whether to send their children to private schools, and whether these choices differed by family income, race, and geographic location. We employ a difference-in-differences strategy, comparing differences in private school enrollment prior to and after the recession among students in metropolitan areas where the local labor market was more or less severely impacted by the recession. We find that the recession did lead to a large decline in private school enrollment in areas that were most severely impacted by the recession. However, these effects may have been concentrated among white, higher-income families in suburbs, and so probably had a limited impact on increasing the socioeconomic or racial diversity of schools.

## **2. Background**

### **2.1. Private School Choice**

In surveys, parents say that the academic achievement and school culture are the most important qualities when deciding on a school for their children, and this preference is universal across parents of all races and incomes (Armor & Peiser, 1998; Collins & Snell, 2000; Schneider, Marschall, Teske, & Roch, 1998). In fact, parents of both public and private school students report that the academic achievement or overall school philosophy is the most important reason that they chose their child's school (NCES, 2007).<sup>1</sup> However, given that around two-thirds of all private schools in the U.S. have a religious orientation (Broughman & Swaim, 2016), the motivations of families choosing public and private schools do differ. In particular, one-third of families who send their children to private schools report religious and/or moral values as the strongest motivator for their school choice, while public school families are much

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<sup>1</sup> Based on author's own calculations using the National Household Education Survey from 2007.

more likely to cite a school's location as a primary motivator (Butler, Carr, Toma, & Zimmer, 2013; NCES, 2007).<sup>2</sup>

When examining theoretical models of private school choice, private school market entry, and actual revealed preferences of families given choice sets that include private and public sector K – 12 schools, family income emerges as a key predictor, at least in more recent decades (Barrow, 2006; Epple & Romano, 1998). At least one earlier study of private school market entry and neighborhood characteristics did not find any link to income (Downes & Greenstein, 1996). However, many more families identified as religious in the 1970s, and income inequality was considerably lower, so it is likely that the relationship between income and private school attendance was much weaker (Murnane & Reardon, 2017). One theory is that given additional disposable income, families will spend some portion of that income on educational enrichment activities and opportunities, possibly including private schools (Kaushal, Magnuson, & Waldfogel, 2011).

Race also consistently explains private school choices, including both the race of a student and the racial composition of a private school compared to local alternatives. Butler et al. (2013) find that Black families are less likely to enroll in private Catholic schools, and Hispanic families are less likely to enroll in non-Catholic religious schools (an unsurprising finding since Hispanic families are much more likely to be Catholic). White, upper-middle income families seem to enroll their children in private schools when the local public schools have high proportions of Black students, and particularly poor Black students (Fairlie & Resch, 2002;

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<sup>2</sup> We urge caution in considering the actual role that distance or location of a school plays, particularly in regards to public school preferences, since location of a school is often endogenous to residential location, and some families may choose residential locations in order to secure spots in certain public school districts. As Hastings, Kane, and Staiger (2005) explain, citing location of a school as a preference given this endogeneity may simply mask some preference for school quality or amenities.

Lankford & Wyckoff, 2006; Li, 2009; Saporito, 2009). Some researchers suggest that this “white flight” is really just a response to the low quality of public schools since high proportions of minority students are often associated with lower average achievement, larger student-teacher ratios, and higher poverty schools. “White flight” to private schools may differ by type of school, perhaps occurring less often or not at all in nonsectarian private schools among younger cohorts (Butler et al., 2013).

Regardless of what actually motivates families to choose private over public schools, the characteristics of students across school sectors does differ. White students account for a much larger proportion of private school students relative to their proportion in the total student population. Students in private schools, on average, demonstrate higher scores on academic achievement tests relative to peers in public schools, and have parents with higher educational achievement on average (Butler et al., 2013; Epple & Romano, 1998).

## **2.2. Trends in private school enrollment and economic downturns**

In 2013, over 4.5 million elementary and secondary students were enrolled in private schools in the U.S. (Broughman & Swaim, 2016), representing just over 8 percent of all students enrolled in schools.<sup>3</sup> This proportion is considerably lower from peak enrollment in private schools of the mid-1960s, when overall private school enrollment accounted for nearly 15% of the elementary and secondary school population (Ewert, 2013). Private school enrollment remained relatively stable, between 9 – 10% of total school enrollment, from the early 1970s to 2000, with only a temporary decline in the 1980s (Ewert, 2013). Since the early 2000s, the number of students enrolled in private schools has been gradually declining.

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<sup>3</sup> From author’s own calculations using the 2013 Current Population Survey.

There are a number of theories to explain the declining enrollment in private schools since the early 2000s. First, the nation as a whole has experienced declining religiosity, and a declining Catholic population in particular (Smith & Cooperman, 2015). The exception, however, is Hispanic families, who are more likely to identify as Catholic, and for whom private school enrollment has continued to increase (Ewert, 2013). Second, the decline in overall private school enrollments was possibly accelerated in part by the Catholic sexual abuse scandal, which broke in the media around 2002 (Dills & Hernández-Julián, 2012). Examining trends in student enrollment by type of private school shows that non-Catholic religious schools and nonsectarian schools both had increasing enrollment trends prior to the recession, and enrollment declines came largely from the Catholic sector (Murnane & Reardon, 2017). A final explanation for the overall decline in private school enrollment as a proportion of total enrollment is due to the increase in charter schools. This theory gained widespread anecdotal traction in the mid to late 2000s (Cech, 2008). Ewert (2013) shows a strong correlation between increasing charter school enrollment and declining private school enrollment in states that saw large growths in their charter school sectors during this time period. One study of average county-level effects of charter expansion finds a similar negative relationship to private school enrollment (Toma, Zimmer, & Jones, 2006). On the other hand, (Chakrabarti & Roy, 2016) examine whether charter school expansion crowded out enrollment at private schools in the state of Michigan, and find null effects.

Private school enrollments have been fairly robust to past economic downturns. In Figure 1, we plot total private school enrollment among elementary and secondary students from 1968 to 2014 using the Current Population Survey. There were six official economic recessions during this time period, which are shaded in grey. Of these, only three of them, including the Great

Recession, lasted longer than one year. The recession of 1973 – 1975 does not coincide with any enrollment declines, and in fact, enrollment increases in the 4 – 5 years following the recession. The recession of 1981 – 1982, which induced a higher peak unemployment rate than the recession in the 1970s (NBER), coincides with a flat elementary enrollment and increasing secondary enrollment. It is possible that this recession could explain a lagged temporary decline in both elementary and secondary enrollments in 1984, but enrollments rebounded by the following year.

*< Figure 1 about here >*

Analysts agree that the Great Recession differed greatly from these past recessions, particularly since it affected the housing market, stock market, and labor market simultaneously. The Great Recession officially began in December of 2007 and lasted through June of 2009 (NBER, 2010). In its aftermath, unemployment rose to the highest levels since the 1980s among all age groups and all education levels. Individuals with lower levels of educational attainment, high school or less, had the largest absolute increases in unemployment, but the unemployment rate increased proportionally by approximately the same amount among workers with all levels of education (Thompson & Smeeding, 2013). Labor force participation decreased more among workers with lower levels of educational attainment. While labor force participation decreased by around only 0.5% for workers with a college degree, it decreased by about 2.2% for workers with only a high school diploma (Thompson & Smeeding, 2013).

The GR had persistent negative effects on school spending. While the federal stimulus helped schools maintain spending through 2011, by 2012, schools faced tight budget constraints due to decreased state and local tax revenue and expenditures. In studies examining the effects of the GR in specific states, it appears that the recession led to teacher layoffs and budget cuts

(Chakrabarti & Livingston, 2013; Chakrabarti & Sutherland, 2012). Schools serving low-income students seemed particularly adversely affected (Chakrabarti & Sutherland, 2012). By the 2014-15 school year, 30 states were still spending less per-pupil than prior to the recession (Leachman & Mai, 2014).

At the same time that schools faced pressures from the GR, families, especially low-income families, also faced new challenges spurred by the housing crisis and constricted labor market. By the end of 2008, around 73% of families reported cutting spending because of the recession (Hurd & Rohwedder, 2010). By April of 2010, nearly 40% of households qualified as being in “financial distress” at some point during the recession, meaning that one of the family members was unemployed, or the family was two months or more behind on their mortgage payment, or the mortgage surpassed the cost of the house (Hurd & Rohwedder, 2010). Families in the lowest income quartile were much more likely to report having been in distress compared to higher-income families. These adverse economic circumstances contributed to increased student mobility and homelessness among public school students (Rogers, Freelon, & Bertrand, 2012). Finally, despite the high unemployment, mobility rates among the unemployed declined during the recession, which could be due to the generally poor economic conditions nationally (Farber, 2012).

### **2.3 Theoretical enrollment response to the the GR**

Theoretical and revealed preference models of school choice are based on utility models in which school choice is modeled as a function of various student and family characteristics (including both observed and unobserved), as well as the characteristics of alternative school options in the choice set. Families will choose a private school if it yields a higher utility than the alternative choices, or if the benefits of enrolling outweigh the costs.



Based on empirical factors that seem to influence families' preferences for private schools, we can make a number of predications about how the GR might have altered families' enrollment decisions. First, although private school enrollment trends did not seem to be affected during recessions in the previous five decades, the GR lasted longer and had more severe effects than any recession since the Great Depression. Therefore, we predict that the GR might have accelerated the declining enrollment trend already present since the early 2000s. Enrollment in nonsectarian schools might have been more adversely affected than religious schools since students are less likely to attend these due to religious convictions, and they tend to have higher average tuition (NCES, 2013).

The role that family income might play in the concentration of the GR's effects is theoretically ambiguous. Since private school enrollment rates for children from low-income families have been very low in recent decades, it seems unlikely that the GR would have affected the enrollment decisions of families from the bottom part of the income distribution (Murnane & Reardon, 2017). The GR could have had its greatest negative effects on the private school enrollment decisions of families in the middle of the income distribution, both because a significant proportion of children from such families have attended private schools historically, and because the GR created the need for these families to cut back on discretionary expenditures. Middle-income families may be less likely to have the savings to inoculate themselves from a loss in income. On the other hand, these families may be more likely to receive financial aid from private schools or to live in school districts of lower average quality, which would suggest that they would maintain their current private school enrollment.

One might predict that the GR would have the least impact on schooling decisions of relatively high-income families who are in the best position to absorb income losses without

significant changes in consumption patterns. At the same time, neighborhood income segregation among families has increased over the past few decades (Owens, 2016), so higher-income students are more likely to live in more affluent public school districts with peers who demonstrate higher scores on academic achievement tests. The marginal benefit of attending a private school would likely be lower, so these students might be more likely to leave private schools during the recession.

In the remainder of our paper, we use a difference-in-differences methodology to test the extent to which the GR changed enrollment trends in private schools, and how and whether these effects varied by family income percentile, race, and geographic location. It is important to understand how the economy influences families' choices because it has implications for the distribution of students across schools and also can provide additional more recent evidence about the relative importance of race and income in sorting students. Private schools are more racially and economically homogenous than public schools, and there is positive selection into private schools, so how to interpret any enrollment changes or redistributions will depend on which students' choices were affected and which alternative choices they made.

### **3. Data & Sample**

#### **3.1. Data**

We use data from the Current Population Survey (CPS) October supplement. Administered by the Bureau of Labor Statistics, the CPS is a nationally-representative, monthly household survey that collects detailed information about the demographic characteristics and labor force participation patterns of the members within a household. Approximately 60,000 households are surveyed each month, with each household surveyed for four months in a row,

out of the sample for eight months, and then surveyed again for four months. One adult in each household provides information about all members in that household.

Each October, the survey includes specific questions related to educational attainment and school enrollment. For each child in a household, the CPS distinguishes whether they are enrolled in school, their grade level, and whether the school is public or private. Since the October supplement is a point-in-time estimate, it captures school enrollment for the fall of the school year. For example, enrollment figures for 2007 reflect school enrollment in the 2007-08 school year. The CPS also includes a rich array of individual and family level demographic variables, including family income, race, parental employment, and geographic locale.

While the CPS has the benefit of annual data and a large sample size, it lacks details related to students' neighborhood characteristics and type of private schools. Therefore, we also use a few additional data sources for supplemental analyses. First, we use the National Household Education Survey (NHES), which is a nationally-representative survey administered between every two to five years by the National Center for Education Statistics, and it collects information on school enrollment, homeschooling, and family involvement in schools. We use individual student-level data from 2006 and 2011 to descriptively examine (1) trends in type of private schools, (2) how neighborhood characteristics mediate trends, and (3) whether families' likelihood of moving neighborhoods in order to attend certain schools can explain the changes in enrollment patterns.

### **3.2. Key Recession Measures**

As we discuss below, we take advantage of variation in the severity of the GR across metropolitan areas to examine how this financial shock influenced both short and long-term private school enrollment. The great recession officially began in the fourth quarter of 2007, and

the nation remained in recession through 2009 (NBER, 2010). During this time, the U.S. national unemployment rate more than doubled, from 4.7% in October of 2007 to 10% by October of 2009.<sup>4</sup> The employment to population ratio fell to its lowest level in nearly twenty years as discouraged workers left the labor market (Thompson & Smeeding, 2013). Despite the immediate impact of the recession on employment, we would expect a lagged response in schooling decisions, particularly in the private school sector where families often make schooling choices, including tuition deposits, between a year to three months prior to the next school year. Since the recession hit during the middle of the school year, the earliest an enrollment effect might emerge would be the 2008-09 school year. However, since the brunt of the recession affected workers and families between 2008-09, it is more likely that enrollment effects would appear even later, in the 2009-10 school year and beyond. To account for this lagged effect, we define “pre-recession” years as 2008 and earlier, and “post-recession” as 2009 and later.

In addition to comparing cohorts prior to and after the recession, we also utilize the variation in the severity of the recession across metropolitan areas. Following the example of other researchers who have utilized variation caused by the GR (Long, 2014), we classify MSAs as “severely affected,” using MSA-level unemployment rates reported by the Bureau of Labor Statistics, a common metric for measuring the strength of local labor market. In subsequent analyses, we test the sensitivity of our results to alternate definitions of recession severity using the employment-to-population ratio, and find similar results.

We define the severity of the recession in two ways. In our primary definition, we define MSAs as having been severely hit by the GR if they experienced an increase of 7.5 percentage

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<sup>4</sup> According to figures released by the Bureau of Labor Statistics calculated using the Current Population Survey: <http://data.bls.gov/timeseries/LNS14000000>.

points or more in their monthly unemployment rate between 2007 to 2009. Defining the MSAs by severity in this manner dichotomizes our sample, with 26% of MSAs defined as being severely affected by the GR. Approximately one-fifth of the students in our sample are identified as living in one of these “highest severity” MSAs. Our second method for defining the severity of the recession is slightly more inclusive. We take the absolute difference between the 25<sup>th</sup> percentile of monthly unemployment in the year prior to the recession and the 75<sup>th</sup> percentile of monthly unemployment in the two years after the recession. Any MSAs for whom this absolute difference was 6 percentage points or greater is defined as having been severely affected by the GR. We term these MSAs as the “moderate severity” cases. Around 30% of the MSAs in our sample fall into this second category. The magnitude of the effects of the recession should be larger when comparing the “highest severity” cases to all other MSAs, and the magnitude of the effects should be somewhat attenuated when dichotomizing along the “moderate severity” indicator.

*< Table 1 about here >*

In Table 1, we compare the descriptive characteristics of metropolitan areas and of the students living in those areas in the highest severity versus lower severity MSAs. Mean unemployment rates obviously differ between the two groups. In the lower-severity group, the average absolute change in the mean quarterly unemployment rate between the beginning of 2007 to the end of 2010 was 4.1 percentage points. This average increase in unemployment is important to note, since it is relatively large, emphasizing the fact that all metropolitan areas saw declining labor market conditions during the GR. The corresponding average increase was 9.1 percentage points in the high severity group. In 2007, private school enrollment rates were quite similar among elementary and secondary students in the two groups, but private school

enrollment among kindergarten students was about 5 percentage points lower in the high severity MSAs. In our sample, students in the high severity group are less likely to live in very large MSAs, and much more likely to live in moderately-sized MSAs. The hardest-hit MSAs are located mostly in the southern and western portions of the country, with almost no metropolitan areas in the Northeast included in the high-severity MSA group.

### **3.3. Analytic Sample**

The analytic sample for this study is comprised of all students between the ages of 5 – 19 years who are enrolled in kindergarten through 12<sup>th</sup> grades from 2004 – 2013. This compilation provides four years of pre-recession data, and six years of post-recession, which offers adequate information to establish trends in private school enrollment prior to and after the recession. Because we use variation in the severity of the recession across metropolitan areas, we limit the sample to students identified as living in an MSA. As shown in Table 1, our final sample includes students in 260 metropolitan areas, and a total sample size of 172,993 students across 10 years. By limiting the sample in this way, we still capture the majority of all private schools and private school students across the country. For instance, in 2007, our sample includes over 86% of all students enrolled in private schools, and this figure remains stable across all years in our dataset.

## **4. Methodology**

We employ a difference-in-differences specification, utilizing variation in pre- versus post-recession private school enrollment trends, and variation across metropolitan areas by severity of the GR. We preview our method using Figure 2, which displays the observed enrollment trends by recession severity from 2004 – 2013. Mean private school enrollment among students in the low-severity metropolitan areas is plotted in the dashed blue line, while

mean enrollment in the high-severity areas is the solid red line. We add a vertical line at 2009 to represent the first year in which we expect to see lagged effects of the recession, and fit simple bivariate regression lines of time on mean enrollment, separately for the pre- and post- time periods. While almost no change appears in the low-severity trend after the recession, there is a large negative intercept shift in the high-severity trend in the post-recession period.

< Figure 2 about here >

To model these trends, we fit a simple Ordinary Least Squares (OLS) model of a binary indicator of private school enrollment on a linear combination of enrollment trend, recession timing, and recession severity measures. Despite having a binary indicator of private school enrollment, we use OLS for simplicity of interpretation. To check whether our results are sensitive to the use of OLS, we also fit logit models, and found consistent results. Our basic OLS specification is show in equation 1 below.

$$Y_{imt} = \alpha + \beta Year_t + \gamma Severe_m + \gamma(Year_t * Severe_m) + \delta PostRec_t + \theta(PostRec_t * Severe_m) + \lambda X_{it} + \mu + \epsilon_{ist} \quad [\text{eq. 1}]$$

The outcome  $Y$  is a binary indicator of private school enrollment for student  $i$  in MSA  $m$  in year  $t$ . We include a yearly private school enrollment trend,  $Year$ , which is centered at 2009, the first year in the post-recession time period. The coefficient  $\beta$  is the pre-recession slope among low-severity MSAs.  $Severe$  is our MSA-level indicator of whether the recession was more or less severe. In alternative specifications, we use the two different definitions of severity as described in section 3.2. We allow the enrollment slopes to differ between higher and lower severity MSAs by including the interaction of  $Year * Severe$ .  $PostRec$  is the indicator of any time period in 2009 or later, which we consider our “post-recession” time period, and  $\delta$  provides the effect on enrollment for students in low-severity MSAs. The coefficient  $\theta$  on the interaction

$PostRec*Severe$  is our coefficient of interest, and gives the differential effect of the recession on private school enrollment for students in high-severity metropolitan areas. In most of our specifications, we include a vector of student-level demographic characteristics ( $X$ ), including those identifying the child's race, whether they live in a city, their parents' highest level of education, and family income percentile.<sup>5</sup> We also include state fixed effects,  $\mu$ , and we use robust errors clustered at the state level.

We are particularly interested in exploring whether the GR led to (1) short-term initial shocks to enrollment (i.e. in 2009 or 2010), (2) persistent, or longer-term enrollment effects, and (3) whether the recession altered trends in enrollment, and for whom. To explore these three potential effects of the GR, we try two separate modifications of equation 1. First, we test whether the recession caused a change in the enrollment trends by interacting the post-recession indicator with the two enrollment time trend measures. We reject any change in slope for either the higher or lower severity groups, a result that is unsurprising given the observed trends in Figure 2, and constrain the slopes in the pre- and post-recession time periods in all other specifications. Next, we distinguish shorter-term from longer-term effects of the recession by including another combination of indicator variables to allow the effect of the recession to differ in the first year after the recession, 2009, as shown in equation 2. Given that the full negative effect of the recession on economic conditions and unemployment lasted into 2010, we expect the effect of the recession on private school enrollment to also lag, or happen gradually. Therefore, we expect that the effect on enrollment by 2010 and later might be larger in

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<sup>5</sup> The CPS has missing information on family income in around 10 – 20% of cases on average in each October supplement. In 2010, the CPS began allocating missing family income. Due to our interest in the relationship between family income and private school enrollment decisions, and in order to use consistency across the range of years in our data, we multiply impute (MI) family income using 20 multiply imputed datasets. In our analyses, we therefore make use of Stata's MI estimation and post-estimation commands.



magnitude than in 2009. The coefficient  $\rho$  is the short-term effect, and it tells the differential effect on students in high-severity MSAs relative to the more persistent post-recession enrollment trend, given by the  $\theta$ . Note that we expect  $\theta$  to be negative, but expect  $\rho$  to be positive, since it is the difference from the long-run post-recession trend.

$$Y_{imt} = \alpha + \beta Year_t + \gamma Severe_m + \tau(Year_t * Severe_m) + \pi 2009_t + \rho(2009_t * Severe_m) + \delta PostRec_t + \theta(PostRec_t * Severe_m) + \lambda X_{it} + \mu + \epsilon_{ist}$$

[eq. 2]

Equation 2 is our preferred specification, and we use it in analyzing subgroup effects. After exploring average effects for all students, we fit separate models by grade level. We expect that families may be more likely to transfer their children out of private schools for kindergarten or Elementary school, when the stakes in terms of college or career skills are not as high. On the other hand, private high schools often charge higher tuition, so the real costs are higher than for kindergarten, particularly when many families are already used to paying for pre-k.

In addition to looking for differences in the effect of enrollment by grade level, we also fit a series of triple differences (DDD) by income level (higher versus lower income), city versus suburb, and race. Based on work by Murnane and Reardon (2017), we have reason to believe that the effect of the recession could vary greatly by family income levels. Prior to the recession, private school enrollment was steady or increasing among families in the top ten percent of the income distribution, while steady or declining among families at the median. We fit a DDD to examine whether the recession particularly affected those families differently. Similarly, given differing trends in private school enrollment prior to the recession among families in central cities versus suburbs, and Black or Hispanic and white students, we also look for differential effects of the recession among these subgroups.

## 5. Results

### 5.1. Primary Results

#### *Overall Private School Enrollment*

Prior to fitting eqs. 1 or 2, we examine the aggregate change in enrollment of the GR by fitting a simple first difference. In column 2 of Table 2 we show the results of the specification that includes individual level covariates. Prior to the recession, K – 12<sup>th</sup> grade private school enrollment was basically flat, and declined around 1 percentage point in the aftermath of the GR, but the overall enrollment trend did not otherwise change. Given that private school enrollment accounted for about 10% of all K – 12 students prior to the recession, this corresponds to an approximately 10% decline in enrollment after the GR.

*< Table 2 about here >*

In column 6 of Table 2, we show our results for eq. 2 comparing the differential effect of the recession among students in the highest severity MSAs to others in lower severity MSAs. Prior to the recession, private school enrollment trends in the comparison group of lower-severity MSAs was declining slowly, about 0.2 percentage points per year. In contrast, enrollment was slightly increasing in the highest-severity MSAs. The coefficients from model 6 suggest that any decline in enrollment as a result of the GR was minimal and temporary in lower-severity MSAs. In higher-severity areas, conversely, the recession had a fairly negative effect. Examining column 5, in MSAs most severely affected by the recession, the GR led to a decline of 2.2 percentage points in private school enrollment. Once we account for fact that the full effect on enrollment was lagged, as shown in column 6, we conclude that the long-term effect on enrollment in the highest severity MSAs was a decline of 3.8 percentage points on average. In 2007, average private school enrollment was 9% of students in high-severity MSAs, so the

recession caused an approximately 40% decline. On the other hand, the recession did not seem to affect the slope of enrollment trends. In the high-severity areas, the enrollment trend had a slightly positive slope, and despite the drop in enrollment after the recession, enrollment eventually continued to rise. However, despite the positive slope in the post-recession period, even by 2013, private school enrollment in high-severity MSAs had not returned to pre-recession levels.

As we would expect, the magnitudes of the effects are larger when using the indicator for highest severity relative to columns 3 and 4, in which we dichotomize the sample along a more moderate indicator of recession severity. The direction and magnitude of the effects in columns 3 and 4 are consistent with the story for columns 5 and 6, but attenuated. The pre-recession trends in enrollment are more similar for the moderate versus low-severity groups, and the overall effect of the recession is a decline of 1.6 percentage points.

#### *Grade Level Enrollments*

Although the recession seemed to have a particularly adverse effect on private school enrollment in areas that were hard hit, we might further expect the effects to differ by students' grade levels. In Table 3, we explore possible varying effects for different grade levels by fitting eqs. 1 and 2 separately among our sample of kindergarten, elementary, and secondary students. Among students in kindergarten, the recession does not differentially affect students in high-severity metropolitan areas. Rather, it appears that enrollment declines, at least temporarily, among kindergarten students across the country in the wake of the GR regardless of how severely the recession affected the local labor market. Enrollment trends at the elementary and secondary level are a different story. As shown in column 4 of Table 3, the GR induced a nearly

3.5 percentage point decline, on average, among elementary students in severely affected MSAs, and the effect in high school was also negative and even larger in magnitude.

< Table 3 about here >

### *Demographic Subgroups*

We explore the differential effects of the GR among demographic subgroups of students by fitting a series of triple differences, modifying eqs. 1 and 2 by including differing effects by family income, city versus suburban locale, and race. In panels a and b of Figure 3, we show the effects of models that use a DDD version of eq. 2, plotting the 95% confidence interval on the coefficients of interest,  $2009*Severe*Subgroup$  and  $Post-Recession*Severe*Subgroup$ . Although many of these effect sizes are not statistically significant at the standard alpha of 0.05 due to the inefficiency of the standard errors, the magnitude and direction of the effects suggest a plausible story for where the effects of the recession were concentrated.

< Figure 3 about here >

Controlling for the short term difference in the first year post-recession, 2009, the coefficient for the long-term effect on enrollment for students in the fifth income quintile (*Q5 Income*) is negative, suggesting a relatively larger decline in enrollment among students from high-income families. We also look for any differential effects among students in the middle or fourth quintiles of income, but find no differences by recession severity. The effect for students in cities relative to suburbs is positive, suggesting that families living in cities were less likely to move their children to public schools, despite the economic downturn. We find no differences by whether students were enrolled in “transition” grades, or grades in which students often start a new school (kindergarten, 1<sup>st</sup> grade, and 9<sup>th</sup> grade).

Perhaps the most puzzling finding has to do with how race seems to affect enrollment trends before and after the GR. In 2013, around two-thirds of students enrolled in private schools were white, despite white students comprising just less than half of all children enrolled in K – 12<sup>th</sup> grades.<sup>6</sup> However, estimates from the subgroup analyses suggest that Black and Hispanic students were relatively more immune to private school enrollment shocks of the GR. The short-term effect on Black and Hispanic students relative to White students was negative, but the long-term effect was positive and statistically significant. When we fit the model separately for Black and Hispanic students, this same trend holds, although it appears that the combined effect is driven by the positive long-term effect on Hispanic students.

## **5.2. Type of Private School**

Although we cannot statistically reject that the effect size of the recession is different for high-income households, we have theoretical reasons to believe that income plays an important role in explaining the decline in private school enrollment, and the direction and magnitude of the subgroup effects are consistent with these theories. We know that the recession affected both the incomes and wealth of families at all parts of the income distribution (Hurd & Rohwedder, 2010). Substantial variation exists in the costs of attending different types of private schools. Nonsectarian schools have higher average tuition (NCES, 2013), and therefore, may be more likely to serve children from higher-income families. Therefore, we examine trends in enrollment by type of private school prior to and after the recession using the National Household Education Survey (NHES).

*< Table 4 about here >*

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<sup>6</sup> Based on the author's own calculations using the 2013 Current Population Survey.

In column d of Table 4, we show the adjusted first difference in enrollment by type of private school. Unfortunately, we are unable to control for any trends in enrollment since we only have one year of data in each time period, or examine differences by severity of the recession. However, we do control for a range of individual and metropolitan area characteristics. While the largest absolute declines in enrollment came from non-Catholic religious private schools, nonsectarian private schools had the largest relative decline in enrollments. In both cases, enrollments were increasing prior to the recession (Murnane & Reardon, 2017), so it seems that the recession may have at least temporarily reversed enrollment trends in these sectors.

### **5.3. Migration**

One explanation for any decline in private school enrollment is that the recession may have caused families to move to areas with better public school districts. To explore this explanation, we examine evidence from the NHES, which asks families, “*Did you move to your current neighborhood so that this child could attend his/her current school?*” If families moved in the wake of the recession, we would expect to see more families responding affirmatively in 2011 than in 2006. However, as shown in Table 5, the proportion of families who report moving to the neighborhood to attend the local schools actually declines during this time period, from 23% in 2006 to only 18% in 2011. Moreover, if we divide schools into sector type, we see that families in all types of public schools (assigned schools and choice schools) are less likely to report moving in 2011, and only families attending private schools show an increase in the likelihood of having moved to attend a school in 2011 relative to 2006.

*< Table 5 about here >*

### **5.4. Neighborhood Mediators**

To build on the results of our subgroup analysis, we use the NHES to descriptively explore the role of neighborhood income and racial exposure in mitigating the negative enrollment effects of the recession. We use individual-level data from 2006 and 2011. For each student in the nationally representative sample, we generate indicators of whether the student's zip code has a high proportion of Black and Hispanic residents (greater than 40% according to the most recent Census estimates) and whether it has a high proportion (20% or more) of children under 18 years living in poverty. Using these indicators, we fit simple difference-in-differences models utilizing variation pre- and post-recession and along these dichotomous indicators. We control for a range of student and family demographic characteristics.

*< Table 6 about here >*

We display the results of these simple models in Table 6. The coefficients on both interaction terms are positive and statistically significant, suggesting that the demographic characteristics of neighborhoods mediates the effect of the recession. More specifically, the findings suggest that private school enrollment in neighborhoods with large proportions of Black and Hispanic residents are more insulated from the negative effects of the recession, as are high-poverty neighborhoods. These results are only descriptive in nature, however, and should be interpreted with caution.

## **6. Discussion**

We care about understanding the effects of the GR on private school enrollment because of how it could alter the distribution of students across schools, and consequently, peer effects, social capital, and student achievement among both private school students and the students remaining in private schools. Overall, our results suggest that the GR led to both immediate and longer-term downward effects on private school enrollment. The recession mainly seemed to

affect enrollment through a steep intercept decline, while the long-term slope in the trend did not appear to change. Despite the clear story told by our results about the effect of the recession on private school enrollment nationally, evaluating the implications of these results are difficult without additional information about the mechanisms and concentration of effects. Our subgroup analysis attempts to do this, and the results suggest a story about where the effects were concentrated, and some factors that may have mitigated the effects of the economic shock.

First, higher-income families seemed more likely to leave private schools in the wake of the GR relative to middle- and lower-income families, although we are unable to reject that the coefficient differs from zero. Among all types of private schools, tuition is highest, on average, in nonsectarian schools, and lowest, on average, in Catholic schools (NCES, 2013). Thus, descriptive comparisons of the pre- and post-recession enrollment estimates by type of private school lend credence to our subgroup results that suggest effects among students from high-income families, who are more likely to have been enrolled at nonsectarian and other religious private schools.

Although we believe that students from higher-income families left private schools in the wake of the recession, how we interpret these results depends on where these students enrolled instead. If they enrolled in diverse public schools, these students could bring positive peer effects and their families could bring social capital, which could yield an increase in resources for students at the school. Wealthier families often live in wealthier communities (Owens, 2016; Owens, Reardon, & Jencks, 2016), so it seems more likely that they may have left private schools for affluent, high-performing public schools, which would likely only exacerbate existing patterns of between-district socioeconomic segregation and possibly academic performance.



Black and Hispanic students in private schools were more insulated from the effects of the recession relative to white students. We can think of a few possible explanations for these results. First, Hispanic enrollment, particularly in Catholic schools, had been rising prior to the recession. It is possible that the choices of families who utilize private schools because of religious or moral values are more immune to economic downturns. Catholic schools tend to have lower average tuition (NCES, 2013), and generally offer tuition assistance to students with financial need. Perhaps relatedly, as we show in section 5.2, Catholic school enrollments were the most insulated from the recession, with the lowest absolute and relative declines in enrollment. Second, if Black or Hispanic students are more likely to use vouchers or more likely to receive scholarships to attend private school, or if their families place a higher premium on private school enrollment, then they would be less likely to exit private schools, assuming their schools' financial aid awards remained stable across the recession.<sup>7</sup>

Effects on private school enrollment may have been lower in cities, in areas with higher proportions of Black and Hispanic students, and with higher proportions of children living in poverty. Families in cities may place a higher value on private schools, particularly if the average achievement of public school districts in cities is lower than than of suburbs. These results could also be influenced by factors we have already discussed – that Hispanic and Black youth were more insulated from the effects of the recession (although we control for student race and income). On the other hand, these results could reinforce consistent findings from the school

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<sup>7</sup> The evidence on how the recession affected private school financial aid is unclear, with at least one source suggesting that according to the National Association of Independent Schools, financial aid increased during the recession from 16% to 21% (Mieszkowski, 2010). Additionally, Catholic schools often pledge to meet the financial needs of their students regardless of the economic conditions. Finally, it is possible that state or local voucher programs helped to offset some of the financial effects of the recession, a topic that we do not explore in this paper.

choice literature that parents utilize private schools in order to avoid public school alternatives with high-poverty student bodies or with high proportions of Black students.

Although we cannot directly compare the effect sizes across the specifications we fit separately by grade level, the pattern of results suggests that the differential effect of the recession increased in magnitude with increasing grade level. There are at least two explanations for this pattern. First, it is possible that it reflects the increasing cost to families of sending their children to private schools, as the cost of schooling increases, on average, with grade level (NCES, 2013). Second, it could reflect the decisions of the comparison group. The post-recession coefficient, which gives the effect in the post-recession time period for the students in the low-severity MSAs, is negative and statistically significant among the kindergarten sample, suggesting that these families responded to the recession, switching their young children to public schools. Conversely, among the elementary and secondary samples, families in low-severity MSAs seemed less likely to switch out of private schools. If the latter hypothesis is correct, then it suggests that families have much lower thresholds for private school enrollment at lower grade levels, and will only switch students from higher grade levels when experiencing an economic burden. We do not find larger effects among transitional grades, or those grades in which students often begin a new school. This result is probably driven by the null effects in kindergarten. This finding, in combination with our grade level findings, suggests that the marginal benefit of private school enrollment seems lower in early grades. Families may have been more likely to move their younger children to public schools even in lower severity areas.

## **7. Conclusion**

Our results clearly indicate that the recession caused a steep decline in private school enrollment. The most obvious explanation for this exodus of private school students is that the

recession impacted family income and wealth, which led families to redistribute their resources away from private school education, particularly when the marginal benefit of private schooling was relatively small. Thus, higher-income families and families living in suburbs, whose public school alternatives were of high quality, seemed more likely to alter their school choice patterns in response to the GR. Our descriptive analyses of family self-reported motivations for moving suggest that the trends we observe are not due to families migrating to districts with better performing public schools, but concentrated among families who already have good alternative options.

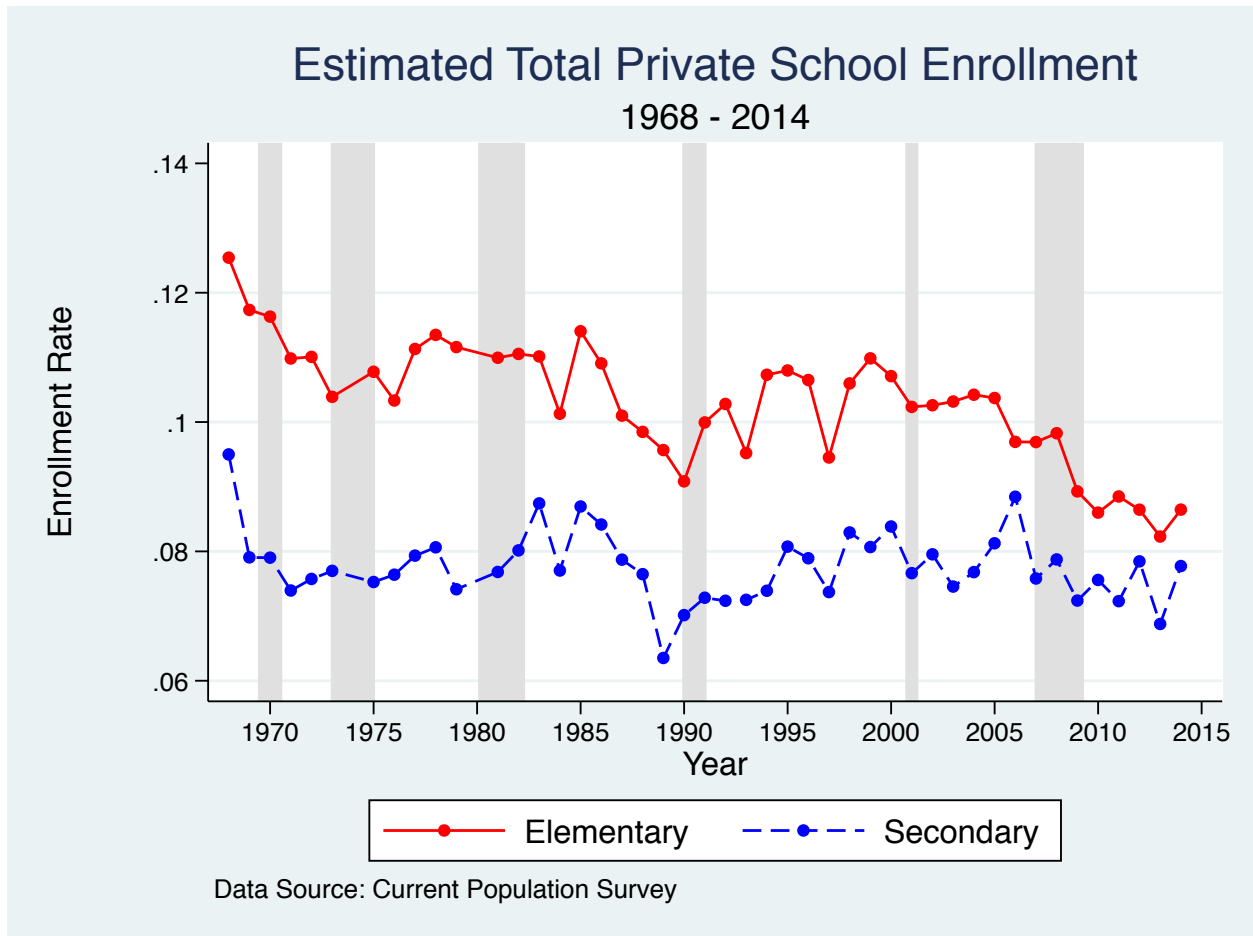
Our data do not allow us to conclusively explore all of the mediating factors involved in influencing enrollment decisions, or all of the theoretical factors that could explain the trends we observe, nor is it our goal in this paper to do so. Nevertheless, our study provides an initial exploration of these topics in order to summarize the potential implications of our results and elicit clear questions for future research.

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## Tables and Figures



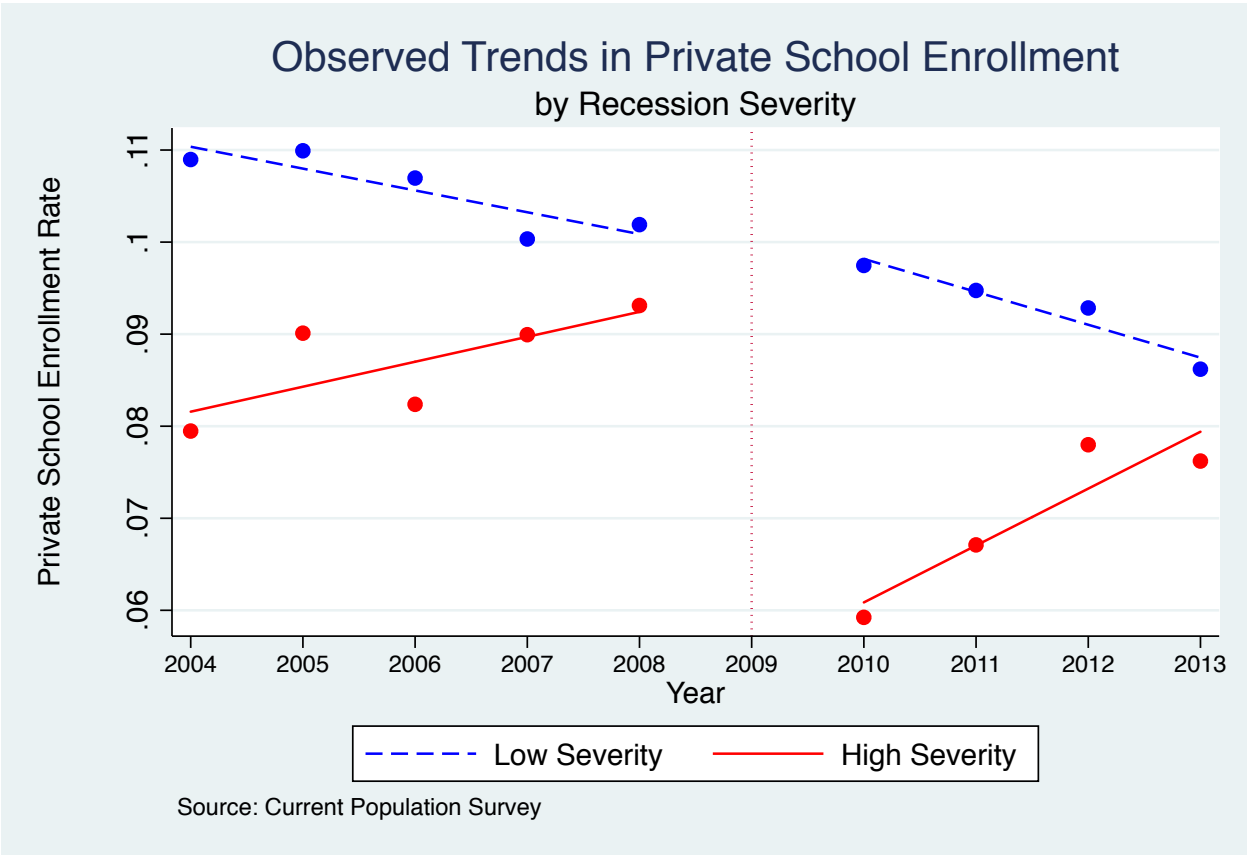
*Figure 1. Trends in private school enrollment, with official economic recessions shaded*

**Table 1. Summary characteristics of MSAs and students living in MSAs, by recession severity**

<b>MSA-Level Statistics</b>	<b>Low Severity</b>		<b>High Severity</b>	
	<b>Estimate</b>	<b>SD</b>	<b>Estimate</b>	<b>SD</b>
<i>Mean Absolute Unemployment Rate Differential (2007 - 2009)</i>	5.1	1.16	9.1	1.45
Mean Quarterly Unemployment Rate (2007)	4.3	0.81	5.8	2.19
Mean Quarterly Unemployment Rate (2010)	8.8	1.67	13.0	2.87
<b>Student-Level Proportions*</b>	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>
<i>Private School Enrollment</i>	0.10	0.003	0.09	0.005
Kindergarten	0.13	0.012	0.08	0.021
Elementary	0.11	0.004	0.10	0.007
High School	0.08	0.005	0.08	0.009
<i>Race/ Ethnicity</i>				
White, Non-Hispanic	0.55	0.005	0.52	0.010
Black, Non-Hispanic	0.15	0.003	0.17	0.007
Hispanic or Latino	0.21	0.004	0.26	0.008
Other	0.09	0.003	0.05	0.004
<i>Region</i>				
Northeast	0.21	0.004	0.01	0.002
Midwest	0.19	0.004	0.23	0.008
South	0.37	0.005	0.37	0.009
West	0.23	0.004	0.39	0.009
<i>Locale</i>				
City	0.33	0.004	0.29	0.009
Suburb	0.55	0.005	0.56	0.009
Not Identifiable	0.12	0.003	0.16	0.007
<i>MSA Size</i>				
100 - 250K	0.08	0.002	0.12	0.006
250 - 500K	0.10	0.003	0.19	0.007
500 K - 1 mil.	0.12	0.003	0.09	0.006
1 - 2.5 mil.	0.21	0.004	0.20	0.008
2.5 - 5 mil.	0.21	0.004	0.29	0.009
5 mil. +	0.29	0.004	0.10	0.006
<i>MSA Sample N**</i>	192		68	
<i>Student Sample N**</i>	143,240		29,753	

\* Student level proportions are calculated using values for 2007.

\*\* Sample sizes are for the entire panel, across all years from 2004 - 2013.



*Figure 2. Observed trends in private school enrollment by severity of the recession*



**Table 2. Effect of the GR on private school enrollment for students ages 5 - 19 in grades K-12th, by severity of the recession**

			Moderate Severity v. All Others (Severe = Moderate Severity)		Highest Severity v. All Others (Severe = Highest Severity)	
	(1)	(2)	(3)	(4)	(5)	(6)
Year Trend	-0.00124 (0.0015)	-0.00106 (0.0012)	-0.00183+ (0.0011)	-0.00217+ (0.0012)	-0.00198* (0.0010)	-0.00240* (0.0010)
Severe			0.00505 (0.0088)	0.00850 (0.0100)	0.0141* (0.0065)	0.0208* (0.0093)
Year Trend * Severe			0.00174 (0.0014)	0.00288+ (0.0016)	0.00345+ (0.0017)	0.00567* (0.0023)
Post-Recession	-0.00757 (0.0054)	-0.00961* (0.0048)	-0.00684 (0.0055)	-0.00448 (0.0068)	-0.00485 (0.0056)	-0.00190 (0.0057)
Post-Recession * Severe			-0.00810 (0.0059)	-0.0161+ (0.0091)	-0.0223** (0.0071)	-0.0380** (0.0116)
2009 Dummy				-0.00336 (0.0055)		-0.00424 (0.0052)
2009 * Severe				0.0116 (0.0090)		0.0223 (0.0137)
Post-Recession * Year Trend	0.000434 (0.0015)	-0.000467 (0.0016)				
Student-Level Covariates	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Observations</i>	<i>172,993</i>	<i>143,255</i>	<i>143,255</i>	<i>143,255</i>	<i>143,255</i>	<i>143,255</i>

Robust standard errors in parentheses, clustered at the state level. Student level covariates include race, parental education, family income percentile, grade level, and whether the family lives in the city. All models include state fixed effects.

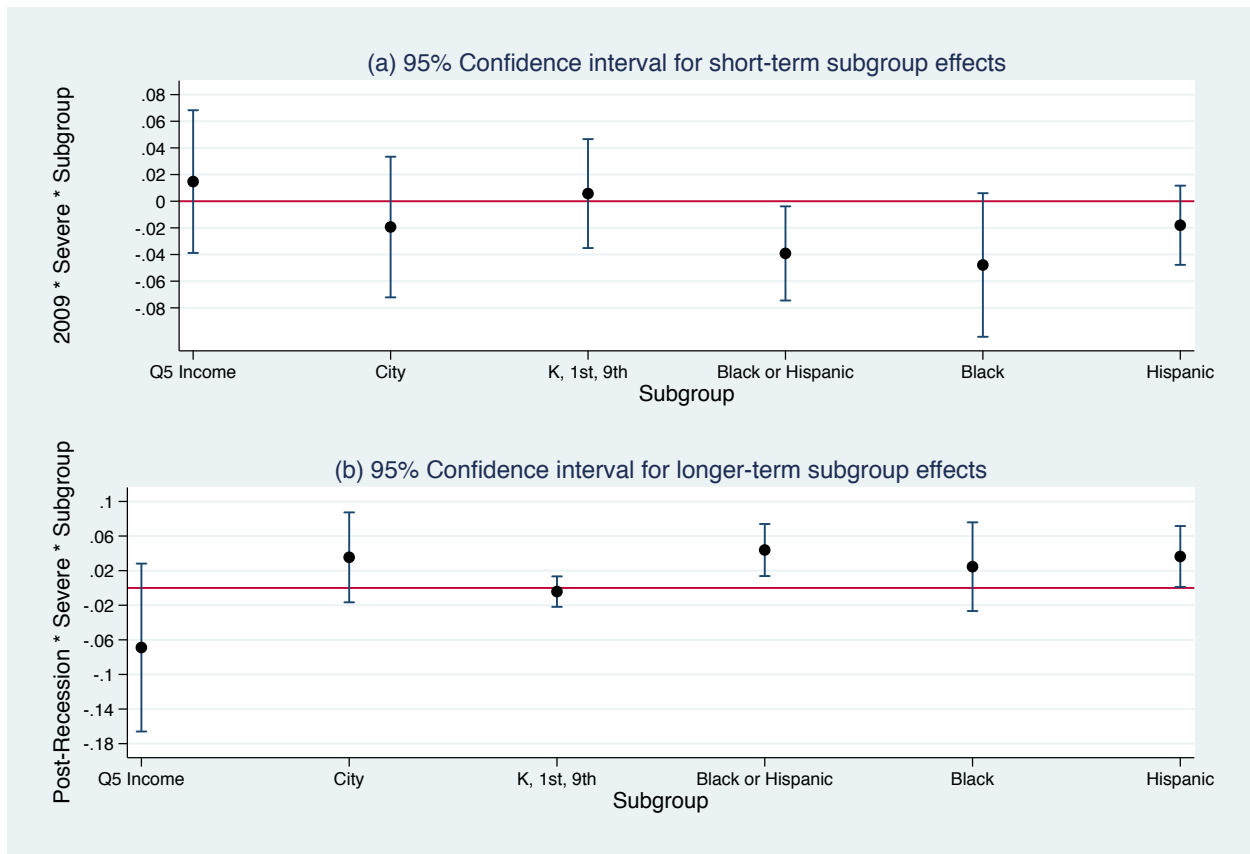
\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.1

**Table 3. Effect of the GR on private school enrollment by kindergarten, elementary School, and high school, by severity of the recession**

	Kindergarten		Elementary		High School	
	(1)	(2)	(3)	(4)	(5)	(6)
Year Trend	0.00215 (0.0034)	-0.000786 (0.0042)	-0.00300* (0.0012)	-0.00316* (0.0013)	-0.000885 (0.0014)	-0.00127 (0.0017)
Highest Severity	-0.0202 (0.0257)	-0.0160 (0.0290)	0.0114 (0.0073)	0.0169 (0.0107)	0.0288** (0.0100)	0.0386** (0.0127)
Year Trend * Severe	0.0108+ (0.0064)	-0.00949 (0.0083)	0.00391+ (0.0023)	0.00573+ (0.0029)	0.00593** (0.0020)	0.00913** (0.0028)
Post-Recession	0.0346* (0.0172)	-0.0142 (0.0245)	-0.00220 (0.0073)	-0.00103 (0.0080)	-0.00318 (0.0091)	-0.000444 (0.0113)
Post-Recession * Severe	0.0349 (0.0387)	0.0258 (0.0487)	-0.0219+ (0.0116)	-0.0346* (0.0166)	-0.0376** (0.0126)	-0.0604*** (0.0172)
2009 Dummy		-0.0294* (0.0143)		-0.00168 (0.0075)		-0.00394 (0.0063)
2009 * Severe		0.0144 (0.0327)		0.0179 (0.0172)		0.0338* (0.0161)
<i>Observations</i>	<i>10,158</i>	<i>10,158</i>	<i>90,224</i>	<i>90,224</i>	<i>42,873</i>	<i>42,873</i>

Robust standard errors in parentheses, clustered at the state level. Student level covariates include race, parental education, family income percentile, and whether the family lives in the city. All models include state fixed effects.

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.1



**Figure 3. 95% confidence intervals for subgroup effect coefficients**

**Table 4. Absolute and relative change in enrollment by type of private school, 2006 - 2011**

	Mean 2006 (a)	Mean 2011 (b)	Unadjusted Difference (c)	Adjusted Difference (d)	Percent Change (e)
All Private*	0.114 (0.0005)	0.077 (0.0003)	-0.0367*** (0.0005)	-0.0336*** (0.0005)	-26%
Religious	0.0863 (0.0004)	0.0674 (0.0003)	-0.0239*** (0.0005)	-0.0221*** (0.0005)	-26%
Catholic	0.0474 (0.0003)	0.0371 (0.0002)	-0.0103*** (0.0004)	-0.00786*** (0.0003)	-17%
Other					
Religious	0.0389 (0.0003)	0.0253 (0.0002)	-0.0136*** (0.0003)	-0.0143*** (0.0003)	-37%
Nonsectarian	0.0274 (0.0003)	0.0193 (0.0001)	-0.0127*** (0.0003)	-0.0114*** (0.0003)	-42%

\* Percent change is calculated using the adjusted difference. Note that the specific types of private schools do not lead to a weighted mean of all private. Some private schools are categorized as a fourth, "Other Private" type, which is not reported here. These are likely non-Christian religious schools that were not captured by the "Other Religious" category.

**Table 5. Proportion of students whose families reported moving in order to attend current school**

	Moved to Attend School	
	2006	2011
<i>Type of School</i>		
All Schools	0.23 (0.001)	0.18 (0.0005)
All Private	0.01 (0.003)	0.08 (0.001)
Public - Choice	0.18 (0.002)	0.07 (0.001)
Public - Assigned	0.28 (0.001)	0.20 (0.0006)

Standard errors, which are shown in parentheses, are generated using balanced repeated replication (BRR) weights provided by NCES.

**Table 6. Descriptive differential trends in private school enrollment prior to and after the GR, by proportion Black & Hispanic or proportion of children in poverty by zip code**

	Black & Hispanic		Poverty	
	Unadjusted	Adjusted	Unadjusted	Adjusted
Post-Recession	-0.0401*** (0.0006)	-0.0349*** (0.0006)	-0.0382*** (0.0005)	-0.0311*** (0.0005)
High-Black & Hispanic	-0.0275*** (0.0010)	0.0118*** (0.0011)		
Post*High-Black & Hispanic	0.0177*** (0.0012)	0.0169*** (0.0012)		
High-Poverty			-0.0460*** (0.0017)	-0.0141*** (0.0018)
Post*High-Poverty			0.0280*** (0.0019)	0.0207*** (0.0018)

Standard errors, which are shown in parentheses, are generated using balanced repeated replication (BRR) weights provided by NCES. The adjusted models control for a wide range of individual and family characteristics.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1