

# Do Foreclosures Affect Boston Public School Student Academic Performance?

Katharine Bradbury, Mary A. Burke, and Robert K. Triest

## Abstract

Foreclosures have well-documented adverse consequences for families living in or owning properties undergoing foreclosure and on surrounding neighborhoods, but they may also have other costs. This policy brief summarizes our research on the impact of mortgage foreclosures on academic performance among Boston public school students. The data show that students who live at an address that experiences a foreclosure tend to score substantially lower on standardized tests (math and English) and also have substantially worse attendance. However, if we account for the influence of student characteristics, housing, and the student's past academic performance on test scores, the size of the foreclosure effects is reduced to nearly zero. We interpret these findings as indicating that underlying (yet unobserved) factors such as economic stress within the family contribute to both poor academic performance and the foreclosure event, rather than implying that foreclosure per se causes deterioration in a student's academic performance.

We also find that foreclosures may harm academic performance indirectly by causing an affected student to change schools during the academic year. However, we cannot say with certainty that the strong negative association between a child's performance and school change—whether the change is precipitated by foreclosure or by other circumstances—reflects a causal relationship.

Accordingly, public policies aimed at improving student performance should address family stressors that jointly cause decreased academic performance and foreclosures. Existing school assignment policies in Boston—based as they are on citywide high schools and three broad zones—loosen the link between residential moves and school changes during the school year. Other policies at the school, district, and community level may help to lessen the disruptive effects of academic-year school changes on performance.

**JEL codes: I20, I24, J24, G21**

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This brief, which may be revised, is available on the web site of the Federal Reserve Bank of Boston at <http://www.bostonfed.org/economic/ppdp/index.htm>.

This brief draws on Federal Reserve Bank of Boston Working Paper No. 13-12, "The Effect of Foreclosure on Boston Public School Academic Performance," by Katharine Bradbury, Mary A. Burke, and Robert K. Triest.

The views expressed in this brief are those of the authors only and do not necessarily represent the views of the Federal Reserve Bank of Boston or the Federal Reserve System.

Thanks to Prabal Chakrabarti and other Boston Fed colleagues for helpful comments and to James Fogel and Ryan Kessler for expert research assistance.

**This version:** November 2013

## Introduction

The wave of foreclosures that followed the recent housing bust and subsequent Great Recession is one of the defining characteristics of the economic crisis. Foreclosures have obvious direct adverse consequences for families living in or owning properties undergoing foreclosure, and also generate negative spillover effects in affected neighborhoods due to the increased prevalence of vacant housing units and deferred maintenance. However, the adverse effects of foreclosure may extend beyond the obvious direct costs. Families' lives are disrupted by the stress, economic loss, and dislocation of living arrangements that accompany foreclosure, and these factors have the potential to affect many aspects of families' wellbeing and behavior. This brief investigates one important aspect of behavior that may be affected by foreclosure: the academic performance of children whose families experience a foreclosure, whether as homeowners or as tenants in foreclosed properties.

We examine the empirical relationship between foreclosures and student academic performance using a unique dataset that matches information on academic performance of Boston Public School (BPS) students with real estate records indicating whether the student lived at an address involved in foreclosure. The measures of academic performance we study are standardized test scores and attendance.

Our statistical results paint an interesting picture. Students who live at an address that experiences a foreclosure tend to score substantially lower on both math and English language arts standardized tests and also have substantially worse attendance. However, the magnitude of these effects is greatly reduced when we control for characteristics of the student and of the housing unit, and is further reduced nearly to zero when we also control for a student's past academic performance. We interpret these findings as indicating that unobserved underlying factors contribute to both poor academic performance and the foreclosure event, and that foreclosure per se does not directly cause deterioration in a student's academic performance. As we discuss below, family financial distress likely precedes foreclosure and this financial stress may, based on evidence from other studies, lead to decreased academic performance of children

in affected households. This suggests that public policies aimed at improving student performance should address the stressors that jointly cause decreased academic performance and foreclosures--perhaps by offering support services to students or by directing families to available sources of economic assistance--rather than intervene directly in the foreclosure process.<sup>1</sup> By the same token, it may be helpful if assessments of the effectiveness of policy interventions aimed at mitigating economic distress and helping families achieve financial stability include measures of children's performance at school, such as whether declines in a child's test scores are avoided despite negative shocks to the family's finances.

Although we do not observe a substantive, direct, causal link from foreclosures to decreased academic performance, foreclosures may indirectly reduce academic performance by causing a student to change schools. Our statistical analysis indicates that students who change from one school to another during the academic year display substantially lower academic performance. However, we cannot say with certainty that this association reflects a causal relationship. While a completed foreclosure almost certainly precipitates a change of residence for the student, under Boston's school assignment policies a residential move by a student does not necessarily mean that the student must change schools. Our results show that residential moves that are not accompanied by school changes exert negligible effects on student outcomes, suggesting that the policy that (in some cases) allows students to stay in the same school following a residential move may reduce the cost of such moves—including those precipitated by foreclosure—relative to policies that more strongly link school assignment to residential location.

Foreclosures may also affect student academic performance indirectly through spillover effects in neighborhoods and schools with high rates of foreclosures and transience. Schools with transient student populations tend to perform less well than schools with more stable student bodies, and so the foreclosure crisis may have indirectly decreased academic performance by increasing transience. The foreclosure crisis may also have had negative effects

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<sup>1</sup> However, policies intervening in the foreclosure process may further other policy objectives.

on neighborhood cohesion in areas with many foreclosures, with possible spillovers onto the academic performance of students residing or attending school in the affected neighborhoods. The statistical analysis underlying this brief does not explicitly identify such effects. However, the results do suggest substantial variation in academic performance across schools and neighborhoods that cannot be explained by the covariates included in the regressions. In future work we plan to investigate the extent to which foreclosures affect student performance through school and neighborhood effects.

The next section of this brief explains the foreclosure process and school assignment policies in Boston. This is followed by a section laying out our empirical findings. A concluding section discusses policy implications of our analysis.

## **Foreclosures and School Assignment in Boston**

### **Foreclosures**

Mortgage delinquencies and foreclosures are typically precipitated by a combination of negative home equity and a negative shock to the owner's finances (for example, job loss, uninsured medical expenses, or divorce). A property owner with positive home equity can sell the property and repay the mortgage loan if a shock to the owner's finances results in difficulty making timely monthly mortgage payments. However, if house prices decrease to the point where the value of a property is less than the remaining loan balance (this is known as the property being "underwater"), then selling the property would not yield sufficient funds to repay the mortgage. In this case, a negative shock to the owner's finances may result in the property owner losing the house to foreclosure.

The mortgage lender may file a petition in Land Court, seeking permission to foreclose on the property after the borrower misses mortgage payments and becomes delinquent on the loan; typically such petitions are filed only after three (or more) monthly payments have been missed. At that point, the borrower can avoid further foreclosure action by becoming current on the mortgage, by selling the property and paying the mortgage balance, by negotiating with the lender to sell the property for less than the outstanding mortgage principal (a "short sale"), or

by renegotiating the terms of the mortgage. If none of these events occurs, then typically after six to nine months a foreclosure auction is held and the property is sold.

Our data do not include direct indicators of family finances aside from a student's eligibility for free or reduced-price school lunches. However, the filing date of a foreclosure petition—the earliest indicator that we have of foreclosure activity—represents a reasonable first signal of financial distress in a family. A foreclosure auction, should one occur, provides additional information about a family's finances, indicating, for example, that the family's financial shock was sufficiently deep and persistent to prevent them from becoming current on the mortgage. Of course, foreclosure events might occur for other reasons, such as when a borrower “walks away” from a home that is extremely underwater regardless of his finances, and therefore our foreclosure variables represent imperfect proxies for family financial conditions.

Figure 1 displays the time pattern of foreclosure petitions and auctions in our dataset of BPS student information matched to property records, and also shows petitions for owner-occupied, 1-to-3-family homes or condos. The time pattern is as expected, with foreclosure petitions and auctions both increasing sharply with the collapse of the housing market and the advent of the Great Recession. Although foreclosure activity increased greatly, even in the peak year only about 3 percent of students resided in a property served with a foreclosure petition and the percentage of students residing in a property that proceeded to a foreclosure auction was less than half of that.

The housing stock of Boston and other New England industrial cities is unusual in the predominance of small, multi-family structures, many of which include one unit occupied by the owner. Forty-three percent of students in our dataset reside in either two-family or three-family properties, and almost three-quarters (72 percent) of the foreclosure petitions in our sample were filed against these same two property types. The students in two-to-three-family structures are either owner-occupants themselves (21 percent of cases), share the structure (as tenants) with the owner (32 percent), or live with other tenants in a non-owner-occupied two-to-three-family structure (47 percent).

The link between a shock to family finances and possible foreclosure is most obvious in the case of an owner-occupier. However, in a small, multi-family structure, a shock to a *tenant's* finances may also raise the risk of foreclosure. For example, the owner may be dependent on timely receipt of rent payments in order to make timely mortgage payments. A shock to a tenant's finances that results in missed rent payments may precipitate missed mortgage payments and eventual filing of a foreclosure petition. In other cases, tenants may be relatives of the owner and share in a shock to the extended family's finances.

## School Assignment

For purposes of assigning students in kindergarten through eighth grade to schools, the city of Boston is divided into the three broad zones (West, East, and North) shown in Figure 2. When entering BPS for the first time (in kindergarten or after a move to the city or from a private school), parents express their preferences among schools within the zone where their residence is located. BPS assigns students via a computer algorithm based on those preferences, sibling and walk-radius priority, and available space (with ties broken by a random number assigned by the computer). The West zone includes 26 elementary and middle schools, the North zone has 32, and the East zone has 35 elementary and middle schools. The 35 BPS high schools serve students citywide, rather than being zone-specific; meaning that residential location does not restrict the high schools a student may attend (although sibling and walk-radius priority still enter the assignment process). One K-8 school and one middle school also serve students citywide.

In our analysis, we distinguish between “structural” and “nonstructural” school changes. A structural school change consists of a move from one (“departing”) school to another (“receiving”) school over the summer, following completion of the highest grade level offered at the departing school or acceptance into an exam school in grade 7. A nonstructural school change is defined as any other change from one school to another, either over the summer or during the school year. Nonstructural school changes may reflect parental requests for a change, recommendations by school personnel that a student would be better served at another BPS school, or a residential move from one of Boston's three school zones to another. A

residential move across zone lines requires a student to change to a school in the zone of the new home address unless the parents assume responsibility for transportation to the old school. (In addition, a small number of school changes occur when schools shut down or merge during our sample period; we control for these school-change “discontinuities” separately from our treatment of structural and nonstructural school changes.)

About 12 percent of the BPS students in our dataset changed residence in a typical school year; see the right-most column of Table 1. Three-fifths of students’ within-BPS residential moves were “in-zone,” that is, the family lived within the same broad school zone before and after the move. As the assignment policy implies, out-of-zone moves were more likely to be followed by or associated with a nonstructural school change than were in-zone residential moves.

Overall, because of Boston’s fairly loose link between residential location and school assignment, only 23 percent of students whose families moved experienced a nonstructural school change in the same school year, or 34 percent if we also include nonstructural school changes in the school year following the residential move.<sup>2</sup> In other words, two-thirds to three-quarters of residential movers do not experience a potentially disruptive, nonstructural school change under Boston’s assignment policy.

## Empirical Findings

Our statistical analysis uses data provided by the Boston Public Schools relating to both individual students and schools for the school years 2003/2004 through 2009/2010, matched by students’ home addresses to property information from the City of Boston Assessor and the Warren Group.<sup>3</sup> The resulting matched dataset contains 350,329 student-year observations, although only 172,828 of these include student test scores (because tests are not given in all

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<sup>2</sup> Furthermore, 7 percent of nonmovers experienced a nonstructural school change in the school year in which they did not move, and 15 percent experienced a nonstructural school change in that or the following school year. Thus, moving elevates the incidence of nonstructural school changes by only 15 to 20 percentage points.

<sup>3</sup> See Bradbury, Burke, and Triest (2013) for a detailed description of the dataset contents and construction.

grades every year). We use these data to estimate a set of linear regressions that explore the relationship between student academic performance and foreclosure activity.

We use three measures of academic performance: standardized (expressed in standard deviations of the state-wide distribution) MCAS test scores for individual students in math and English language arts (ELA) and a variable measuring the percentage of school days when a student was present. We regress each of these academic performance measures on a number of explanatory variables. The conditioning variables we focus on most are (i) a variable indicating whether a foreclosure petition was filed on the student's place of residence during the academic year (July 1 – June 30), (ii) a variable indicating whether the student moved to a different address during the school year, and (iii) a variable indicating whether the student made a nonstructural school change between October 1 and June 30 of the school year.

In addition to a variable indicating whether a foreclosure petition was filed in the current year (the contemporaneous foreclosure variable), we also include a variable indicating whether a foreclosure petition was filed in the previous year (the lag of the foreclosure variable) and a variable indicating whether a foreclosure petition was filed in the subsequent year (the lead of the foreclosure variable). The purpose of including the lead and lag variables is to explore whether there is a causal relationship between foreclosures and academic performance or whether the relationship is instead driven by factors, such as family financial stress, that underlie both foreclosures and poor academic performance.

Table 2 shows the foreclosure petition coefficients from simple bivariate regressions where the academic performance variables are regressed on the contemporaneous foreclosure petition indicator with no other explanatory variables except school year and grade. The coefficients are negative, statistically significant, and sizable, indicating that students who lived at an address where a foreclosure petition had been filed in the current year exhibited significantly worse academic performance than students who were not affected by a foreclosure petition. Because the MCAS dependent variables are standardized test scores, the coefficients on the foreclosure petition indicator variables may be interpreted in terms of standard deviations of the state-wide distribution of scores. For example, the coefficient value of -0.21 on the

foreclosure petition for the math score regression indicates that BPS students who lived at an address on which a foreclosure petition was filed, scored roughly a fifth of a state-wide standard deviation lower on the math MCAS exam, on average, than did those BPS students whose homes were not subject to a foreclosure petition. In the attendance regressions, the estimated coefficient of -1.39 indicates that a foreclosure petition is associated with roughly 2½ fewer days of attendance, based on the standard 180-day school year in Massachusetts.

Table 3 is similar to Table 2, but adds the lag (last year) and lead (next year) of the foreclosure indicator to the regressions. The coefficients on the lag and lead of the foreclosure indicator are statistically significant and of similar magnitude to the contemporaneous coefficient. One interpretation of this coefficient pattern—and particularly the large size of the coefficient on next year’s foreclosure in the test-score equations—is that a foreclosure petition is a symptom or result of factors that also contribute to poor academic performance. For example, persistently low family income is likely to be associated with both high risk of foreclosure and poor academic performance. Temporary economic stress from a shock to the family’s finances may also underlie the pattern of coefficients. As discussed in the preceding section, economic stress is generally a precipitating factor in mortgage default and foreclosure. Economic stress undoubtedly precedes the first delinquent payment and eventual filing of a foreclosure petition by many months, which would result in a negative coefficient on the lead of the foreclosure indicator if economic stress reduced academic performance. Although the significant negative coefficient on the lead of the foreclosure indicator is consistent with the economic stress explanation, it is inconsistent with foreclosures having a direct causal effect on academic performance.

In order to better isolate the effect of foreclosures from the factors that are associated with increased likelihood of both foreclosure and poor academic performance, we regress the academic performance variables on an extensive group of covariates (listed in Table 4), plus a lag of the dependent variable; in addition, we include indicators of a residential move during the year, structural and nonstructural school changes over the summer, and nonstructural school change during the school year. The coefficient estimates and associated 95 percent

confidence intervals are displayed in Figure 3 (for the test score regressions) and Figure 4 (for the attendance regression). The foreclosure indicator coefficients are very small and mostly statistically insignificant. This is strong evidence that foreclosures have, at best, only a small direct negative causal effect on academic performance. Interestingly, in regressions (not reported here) where we interact the foreclosure petition variables with indicators of owner-occupancy, the owner-foreclosure coefficients are small and statistically insignificant and the coefficients on the noninteracted foreclosure petition variables are little changed, indicating virtually no difference between the children of owners and renters in the association between foreclosure and school performance.<sup>4</sup>

The residential move variable coefficients are small and statistically insignificant in the test score regressions, suggesting that, all else being equal, residential moves are not associated with lower MCAS test scores. Residential moves are associated with a relatively small but statistically significant reduction in attendance.

The coefficients on nonstructural school change during the school year (between October and June) are negative and statistically significant in all three of the academic performance regressions. These coefficients are considerably larger than the estimated coefficients on any of the foreclosure variables, indicating that changing schools during the school year is associated with a math or ELA test score about one-fifth of a statewide standard deviation lower than for a student who does not change schools. Thus, one way that foreclosures may reduce test scores is by precipitating a school change. The main path by which a foreclosure results in a school change during the school year is via a residential move associated with the foreclosure. Boston's school assignment policy plays an important role in attenuating the relationship between foreclosures and nonstructural school changes. As noted earlier, all Boston high schools are citywide, and non-high-school students are not required to change schools following a residential move unless the new address falls within a different schooling zone (among West, East, and North) than the previous address.

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<sup>4</sup> See Bradbury, Burke, and Triest (2013) for details.

The BPS school assignment policy likely reduces the effect of foreclosures on student performance relative to alternative policies that would require school changes in a greater fraction of residential moves. However, one must be cautious in drawing causal inferences regarding the effect of nonstructural school change on academic performance. It is possible that unobserved factors not included in the regressions are associated with both poor academic performance and a relatively high likelihood of changing schools.<sup>5</sup>

## Policy Discussion

A robust finding of our analysis is that students whose families experience a foreclosure event tend to have worse academic performance than those whose families do not experience a foreclosure event. However, foreclosures per se appear not to be the cause of the poor academic performance. Instead, the factors that make families vulnerable to mortgage default and foreclosure also place students at high risk of not doing well in school.

Both persistently low income and shocks to family finances are likely candidates to be the factors that jointly cause foreclosures and poor academic performance. Although the strong negative association between foreclosure petitions and school performance shown in Tables 2 and 3 are probably driven by these factors, the estimates do not fully capture the effects of economic distress. Many families that experience shocks to their finances never receive a foreclosure petition, but students in these families likely suffer consequences to their academic performance similar to those suffered by students in families that receive foreclosure petitions. Homeowners with substantial equity who experience a shock to their ability to make timely mortgage payments may be able to sell their house and pay off their mortgage debt without ever receiving a foreclosure petition, but they still experience a diminished standard of living and the disruptions associated with residential dislocation. Similarly, not all renters who experience economic shocks and miss rent payments will push their landlords into foreclosure.

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<sup>5</sup> Including leads and lags of nonstructural school change in the regressions provides partial support of this hypothesis, leading to our recommendation to exercise caution in drawing policy conclusions regarding the effect of nonstructural school changes on test scores. See Bradbury, Burke, and Triest (2013) for additional information.

They may experience substantial economic stress and/or they may be forced to move without a foreclosure petition being filed for their residential address.

These patterns suggest that, in attempting to ameliorate the below-average school performance observed for foreclosure-affected children, policymakers should seek to mitigate the underlying stressors contributing to foreclosure rather than focusing on legal interventions in the foreclosure process itself. For example, additional academic and social support services might be offered to students subject to extreme financial distress, although targeting and identifying such students may raise issues of privacy and fairness. Communication between BPS and the city's Department of Neighborhood Development, which undertakes policies related to foreclosure prevention and other issues of neighborhood economic vitality, might provide one starting point, if privacy concerns can be successfully addressed.

Perhaps more important, the task of addressing acute economic shocks and chronically low income goes well beyond the purview of the public school system. The value of ongoing community development efforts, anti-poverty policies, and crisis intervention services should be seen as including some spillover benefits to children's success in school. Organizations and programs that address issues of financial stability, especially holistic approaches such as Chelsea's CONNECT and the Crittenton Women's Union, may have beneficial side effects on the school performance of the children whose parents they work with to the degree that they reduce the family's economic stress.<sup>6</sup>

Another strong finding in our analysis is that changing schools during the school year is associated with lower academic performance. While our results raise questions about whether this relationship is causal, it nonetheless seems useful to think about school assignment

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<sup>6</sup> CONNECT's mission is "to integrate, in one central and supportive location, resources to address the community's housing, financial, educational, and employment needs, while nurturing social networks to provide the glue and sustenance for each individual and family's journey toward economic security." [from <http://www.connectnow.org/about-us/the-connect-model/>] Similarly, Crittenton Women's Union states that it "uniquely combines direct service programs, independent research, and public advocacy in its mission to help low-income women and their families achieve economic self-sufficiency. Each year CWU helps approximately 1,400 people through its Mobility Mentoring™, housing, education, and workforce development programs." [from [http://www.liveworkthrive.org/ways\\_we\\_help](http://www.liveworkthrive.org/ways_we_help)]

procedures and other school policies that affect the prevalence of mid-year, nonstructural school changes.<sup>7</sup> As noted earlier, Boston’s existing school assignment policy—based on three broad school attendance zones for elementary and middle-school students plus citywide high schools—increases the likelihood that a student who changes her residence will be able to avoid having to change schools (compared with school assignment policies that more strongly link residential location to school location.) However, Boston recently adopted a new set of procedures for school assignment, scheduled to take effect in the 2014–2015 school year, which are not based on geographically fixed zones but instead provide a customized choice of schools designed around a student’s home address.

The new, “home-based” approach retains citywide high schools and will offer the parents of each non-high-school child entering the Boston Public Schools a choice among six or more schools. The choice set includes the two nearest-to-home schools that are also in the top quality quartile of all schools, and additional schools as close to home as possible and potentially from the top three quality quartiles; the list also includes all the schools in the family’s walk zone (within one mile from home) and three nearby “capacity” schools (defined as those with available seats). Parents rank their preferences among the schools on the customized list, and assignments are based on seat availability and sibling preference.<sup>8</sup>

It is not clear under the new policy what rules will apply to children whose home address changes after they begin attending a specific BPS school (from the customized list that was based on their prior home address).<sup>9</sup> However, the new plan does “grandfather” *current* students by letting them stay at the school they are currently attending after the new plan is

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<sup>7</sup> A 2010 report and survey of the literature argues that “...while research suggests that the academic achievement of students is affected by a set of interrelated factors that includes socio-economic status and parental education, there is evidence that mobility has an effect on achievement apart from these other factors. Specifically, the body of research suggests that students who changed schools more frequently tended to have lower scores on standardized reading and math tests and to drop out of school at higher rates than their less mobile peers” (U.S.G.A.O. 2010, page 16).

<sup>8</sup> While six schools is the minimum, BPS expects that a typical list will include 8 to 14 schools. The overview in the text is based on the description at <http://bostonschoolchoice.org>.

<sup>9</sup> At this writing, we are not sure whether the policy regarding residential moves has been decided.

implemented in the fall of 2014.<sup>10</sup> As a result, we cannot yet determine whether the new school assignment program tightens or loosens the link between residential moves and school changes.

Nonetheless, the home-centered design of the policy, which is expected to reduce the average distance travelled to school by 40 percent compared with current conditions, suggests that residential moves will be more likely to necessitate school changes than is the case under the current policy.<sup>11</sup> However, the potential disruption caused by a required school change might be mitigated if, for example, the change could be deferred until the start of the following school year while the student finishes out the current year at the current school, with transportation assistance from BPS if necessary. Policymakers would need to evaluate this potential tradeoff of transportation costs against students' educational disruption costs.

Independent of school assignment, other policies might help to limit the number of nonstructural school changes during the school year or help to reduce any negative impact of school changes on student performance. When a family is obliged to change its residence, for example because of a foreclosure or eviction, school officials or other social service providers might help parents identify suitable locations that would not require a school change; if a school change cannot be avoided or is sought voluntarily, again the family might receive assistance (for example in the form of transportation) in delaying the school change until the summer.

Even though most school changes are not precipitated by foreclosure, housing policies that work to prevent foreclosures, or that attempt to keep people in their homes when foreclosure does occur, could reduce the incidence of disruptive school changes.<sup>12</sup> Moreover, it might prove beneficial if programs aimed at promoting financial stability were to encourage parents to consider moves that do not require a school change, especially a change during the school year, and were to help financially distressed parents of potentially affected school

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<sup>10</sup> The *school choice.org* FAQs page says "BPS might not provide transportation after the 2019–2020 school year for students in out-of-zone schools," but it is not clear what "out-of-zone" means in the "home-based" context.

<sup>11</sup> See <http://bostonschoolchoice.org> for more details.

<sup>12</sup> For example, Fannie Mae's deed-for-lease program allowed qualified owners to continue as tenants at their foreclosed property for up to 12 months; the same program and related Fannie-Mae programs enabled tenants in foreclosed properties to avoid eviction for up to 12 months (possibly more) following the foreclosure and to receive financial assistance for relocation.

children find affordable homes that meet this criterion. At the very least, families and service providers should be made aware of the potential costs to children—in terms of weaker school performance—of residential moves that involve a school change during the school year, so that they could weigh such costs against the housing cost savings of residential moves across school assignment zones.

Students change schools during the school year for a variety of reasons not associated with residential moves. To the degree that changes reflect parental choices, school officials could encourage parents to implement those choices over the summer. By the same token, school officials themselves could increase their efforts to focus their program-related school transfers during the summer. If there are disruption costs to the student, these costs should be considered an offset to the benefits that justify the school change; many parent-initiated or BPS-initiated school changes will undoubtedly still come out on the benefit side of the cost-benefit scale, but our results suggest that the costs of an academic-year school change are non-negligible and hence might shift the balance in some cases.

Schools, districts, and neighborhoods may be able to develop strategies that lessen the disruptive effects of a school change. A recent report (Rennie Center, 2011) focuses on the difficulties of school changes for both individual students and the origin and destination schools in Massachusetts. Based on data and interviews, the report documents a range of mobility-related problems and lays out proposed methods to ameliorate the negative impacts on the students and on their teachers and classmates. These policies include statewide practices and district- and school-level strategies to ease transitions and minimize disruptions, ranging from schools developing welcoming materials and assigning new students a “buddy,” to providing professional development for teachers and standardizing curricula across schools, to educating parents (and also state housing and human service agencies) about the consequences of mobility, and making sure state record-keeping is up-to-date to facilitate rapid exchange of student records. To the extent that school changes are prompted by underlying economic stress, broader social policies that seek to alleviate poverty and buffer the effects on family finances of acute economic shocks may help to prevent school changes and/or help to minimize negative

spillovers to children's academic outcomes. For example, one recent study finds that a free breakfast program in New York City schools contributed to higher attendance rates among black and Asian students.<sup>13</sup>

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<sup>13</sup> Leos-Urbel et al. 2011.

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Table 1: Residential Moves and School Changes in the Same School Year

Residential moves this school year	Percentage with nonstructural school change (row %)	Percentage of all BPS students (column %)
All BPS Students	9.1	100.0
No Residential Move	7.2	88.3
Any Residential Move	23.2	11.7
Move out of zone	33.1	4.7
Move within zone only	16.6	7.0

*Notes:* “Move out of zone” includes some students with two or more residential moves, of which at least one was out of zone. “Nonstructural School Change” includes some students with two or more school changes, of which at least one was nonstructural. *Source:* Authors’ calculations based on data from the Boston Public Schools.

Table 2: Estimated Coefficients (and Standard Errors)

	Dependent Variable		
	Math score	ELA score	% Attended
Foreclosure Petition	-0.213*** (0.023)	-0.127*** (0.025)	-1.385*** (0.185)

*Notes:* These coefficients are partial correlations; equations also include school year and grade. Standard errors (in parentheses) are clustered by student identification number. Significance is denoted as follows: <sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . *Source:* Authors’ calculations based on data from the Boston Public Schools, the City of Boston Assessing Department, the Warren Group (foreclosure petitions), and Lauren and Timothy Lambie-Hansen (foreclosure auctions).

Table 3: Estimated Coefficients (and Standard Errors)

	Dependent Variable		
	Math score	ELA score	% Attended
Foreclosure Petition Last Year	-0.216*** (0.028)	-0.143*** (0.030)	-1.092*** (0.236)
Foreclosure Petition This Year	-0.202*** (0.024)	-0.130*** (0.026)	-1.122*** (0.201)
Foreclosure Petition Next Year	-0.205*** (0.024)	-0.151*** (0.025)	-0.937*** (0.184)

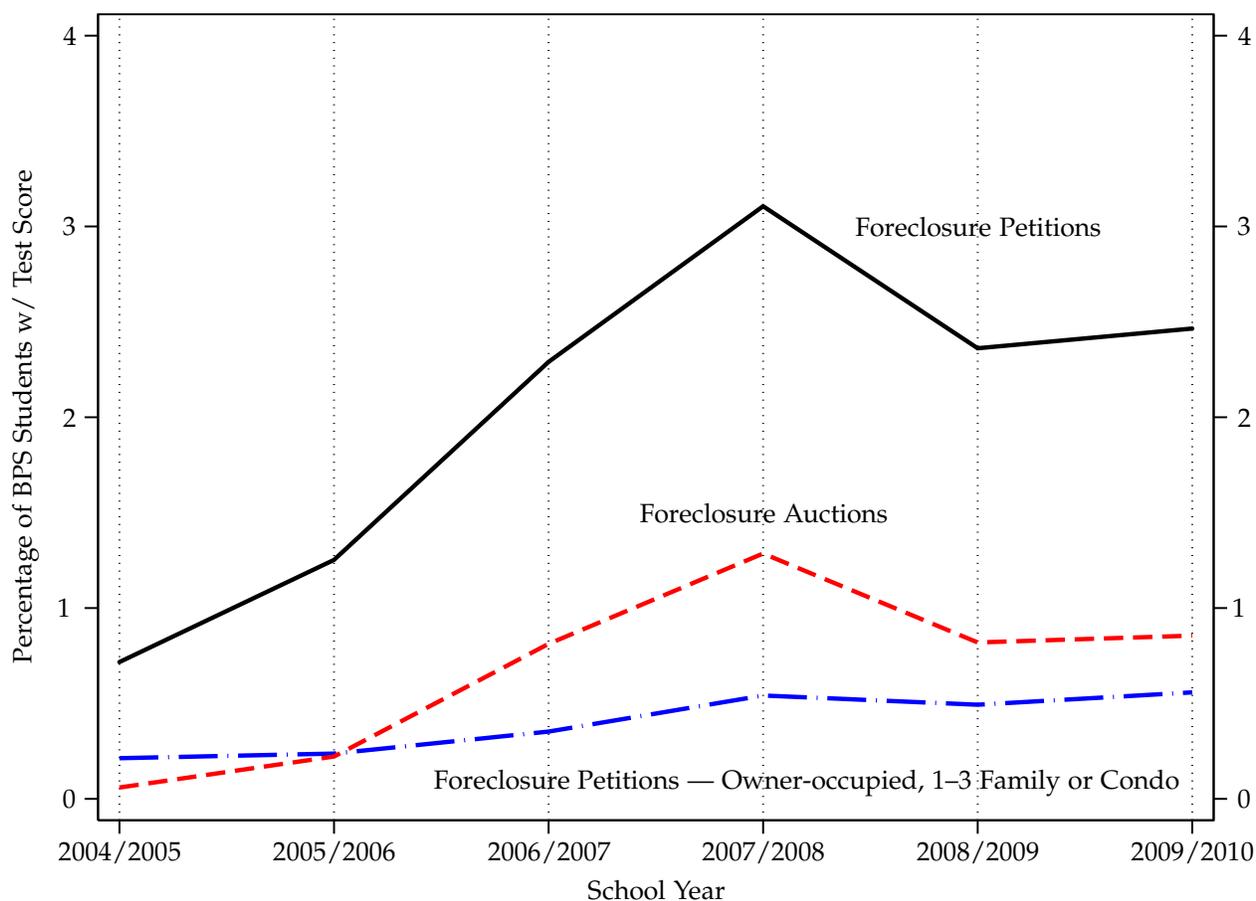
*Notes:* These coefficients are partial correlations; equations also include school year and grade. Standard errors (in parentheses) are clustered by student identification number. Significance is denoted as follows: <sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . *Source:* Authors’ calculations based on data from the Boston Public Schools, the City of Boston Assessing Department, the Warren Group (foreclosure petitions), and Lauren and Timothy Lambie-Hansen (foreclosure auctions).

Table 4: Defining Groups of Control Variables

Variable Group	Variables	Time Observed
Student Demographics	race, sex	June
Student Characteristics	LEP, special education, low-income, changes in low-income status between year $t$ and year $t + 1$ , no scaled score	October
Owner and Property Type	owner, property type (single family, 2–3 family, 4+ family, exempt, other)	Previous June 30
Student Grade	Student grade dummies	October
Test Grade	MCAS test grade dummies	Time of test
School Year	school year dummies	
School Fixed Effects	BPS school ID dummies	March
Census Tract Fixed Effects	Census tract ID dummies	Previous June 30

Notes: “No scaled score” included in test score regressions only. Source: See discussion in Data Appendix and text of Bradbury, Burke, and Triest (2013).

Figure 1: Time Trends of Foreclosure Events Among BPS Students



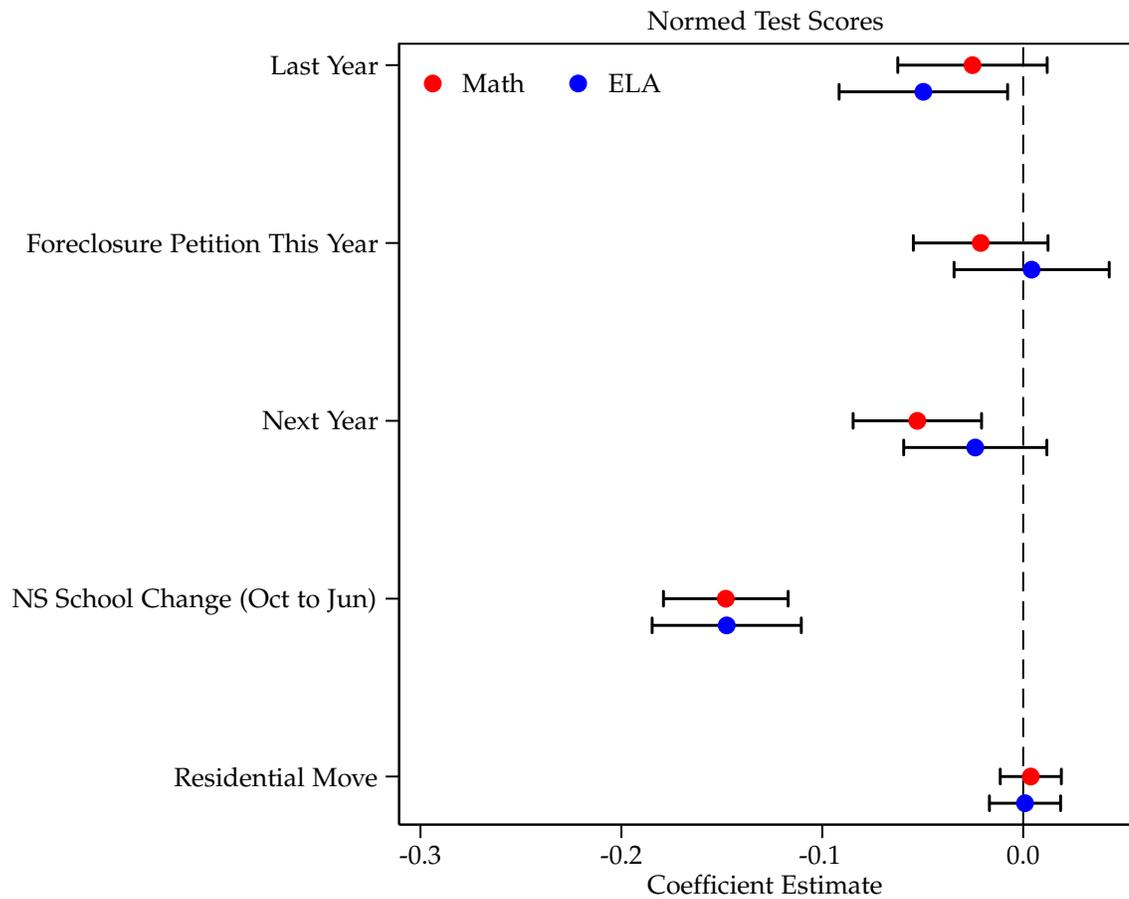
Notes: This figure presents the percentage of BPS students in each school year with a math or ELA test score who experience a foreclosure event. Source: Authors’ calculations based on data from the Boston Public Schools, the City of Boston Assessing Department, the Warren Group (foreclosure petitions), and Lauren and Timothy Lambie-Hansen (foreclosure auctions).

Figure 2: BPS School Assignment Zones



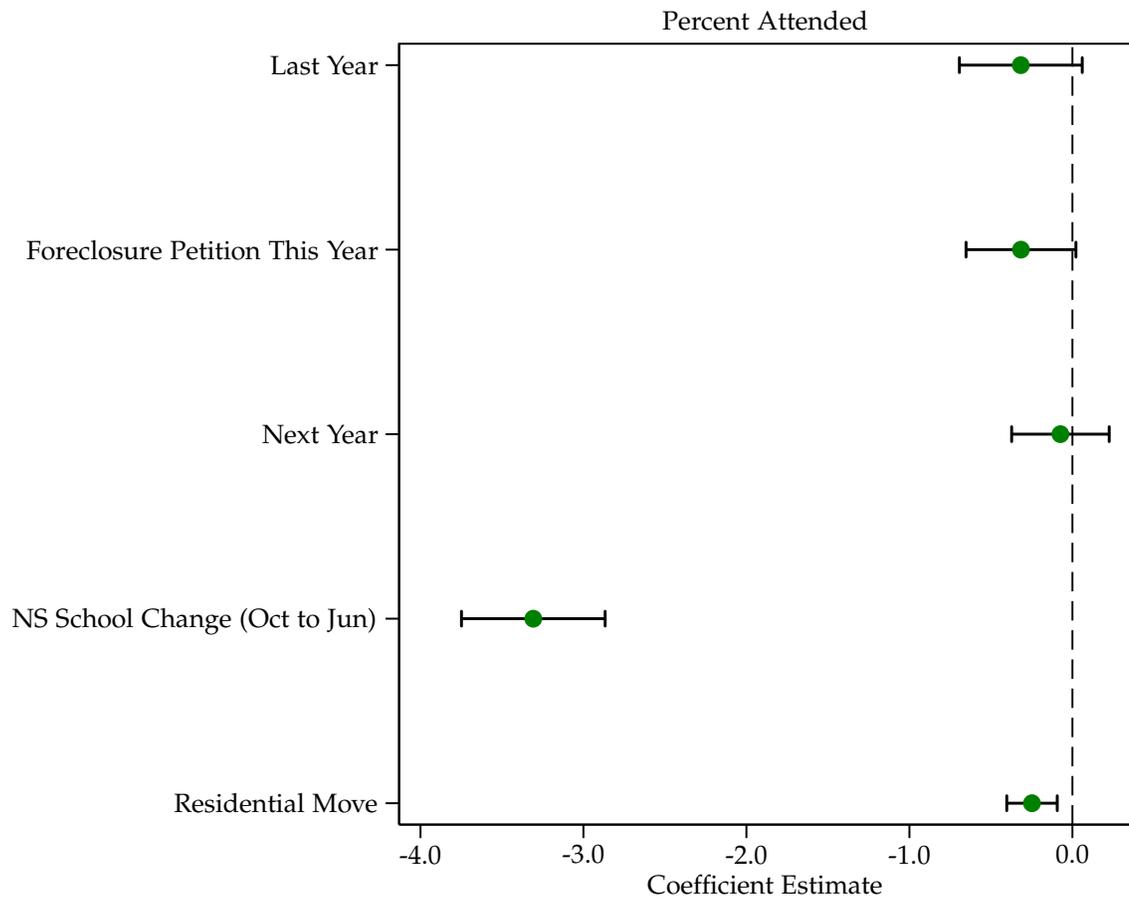
Source: <http://www.bostonpublicschools.org/assignment>

Figure 3: LDV Specification Test Score Coefficients and 95 Percent Confidence Intervals



Source: Authors' calculations based on data from the Boston Public Schools, the City of Boston Assessing Department, the Warren Group (foreclosure petitions), and Lauren and Timothy Lambie-Hansen (foreclosure auctions).

Figure 4: LDV Specification Percent Attended Coefficients and 95 Percent Confidence Intervals



Source: Authors' calculations based on data from the Boston Public Schools, the City of Boston Assessing Department, the Warren Group (foreclosure petitions), and Lauren and Timothy Lambie-Hansen (foreclosure auctions).