

Do Children Lose More than a Home?

The Effects of Foreclosure on Children's Education Outcomes

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Statement of the Research Problem. The recent housing crisis has produced profound changes in the economic conditions of families and communities across the nation. Average home values have dropped dramatically since 2005, stripping families of home equity. Many families have been unable to sustain high mortgage payments, especially if their home is worth less than their mortgage. As a result, nationwide foreclosure rates have skyrocketed by 225 percent since 2006; currently, 1 in 33 homeowners faces foreclosure (RealtyTrac, 2009).

While the housing crisis damages families through the loss of wealth and/or the loss of a stable home through either direct foreclosure or eviction from foreclosed rental properties, there are likely far broader effects for school aged children in particular. Foreclosure on a family's home or eviction from that home as a result of foreclosure introduces significant uncertainty to a child's life (Roy, Maynard, and Weiss, 2008); foreclosure may force a neighborhood move or school change, disrupting social ties and requiring children to adapt to new environments. Youth displaced due to direct foreclosure are not only more exposed to the adverse effects of mobility, but also experience changes in the physical home and community settings. These can include changes in neighborhood and peer composition, as well as changes in community amenities such as the school environment and homeownership rates.

Even youth who do not directly experience a foreclosure or eviction may be affected adversely by the housing crisis and associated changes in community settings. For example, Immergluck and Smith (2005) recently found that children living in communities with high foreclosures are more exposed to crime and instability among peers. As another example, declining local property tax bases and decreasing school enrollments in areas caught in the crisis may change the level and distribution of fiscal and teacher resources across schools.

Further, foreclosures disproportionately affect minority households and minority neighborhoods, whose children already face greater academic challenges, are more likely to change schools, and are more likely to reside in communities with higher crime rates, lower achieving schools, and greater racial segregation. For example, recent research by Kalil and Wightman (2009) demonstrates that even middle-class minorities are dramatically more likely to suffer in the case of adverse events such as job loss. It stands to reason that depreciating home values and foreclosures may have a similar disparate impact on middle-class minorities, thereby exacerbating existing racial inequalities and broadening an already significant achievement gap.

Although there is broad consensus among policymakers that the effects of the housing crisis are far-reaching, there is little empirical evidence establishing the existence or magnitude of such effects. It is difficult to identify the effects of home price depreciation and foreclosure separately from the effects of other challenges families face, such as unemployment and other income shocks, which shape youth, family, and community outcomes. The proposed study addresses this challenge by linking housing data to longitudinal student data in order to estimate the effects of home price depreciation and foreclosures on youth settings and education outcomes in one or more large school districts in California and Florida. Many communities in California and Florida experienced sharp decreases in home values and high foreclosure rates in recent

years, presenting a representative and yet amplified context in which to analyze the impacts of the housing crisis. In the last three years, home values in San Diego and Pinellas (St. Petersburg/Clearwater) counties—the location of the two school districts in this proposal—plummeted by 41 and 46 percent, respectively. Currently, California and Florida rank first and second highest in the number of foreclosure filings among all states. Relative to a 2008 national foreclosure rate of 1.84 percent, rates in San Diego and Pinellas stand at 3.99 and 4.14 percent, respectively (RealtyTrac, 2009).

Results from this study will provide much-needed evidence to inform both the nature and level of policy supports provided to youth, families, and communities caught in the crisis. The specific research aims are:

- 1. To analyze how neighborhood and school characteristics, such as local school quality, crime rates, employment opportunities, and segregation, changed over time in neighborhoods experiencing rapid home price depreciation and high foreclosures or in schools that serve the residents of those neighborhoods.*
- 2. To identify changes in education outcomes for youth living in neighborhoods strongly affected by the housing crisis, and compare these changes to outcomes for youth living in comparatively unaffected neighborhoods. Education outcome measures will include measures such as test score gains over time, mobility across schools, educational attainment (such as high school completion rates), and adverse disciplinary events.*
- 3. To investigate education outcome changes for students who directly experienced displacement due to foreclosure in both owner-occupied and rental properties, and compare these measures for students living in the same neighborhood who did not.*

To address these aims, we will employ a novel data set geographically linking public record housing and foreclosure data and data on community characteristics to longitudinal student and school data in school districts in California and Florida: San Diego and potentially Fresno in California, and Pinellas County (St. Petersburg/Clearwater) in Florida. These districts each maintain longitudinal data systems that track students over time and are willing to provide student residential address data. The district administrative databases will include student-level demographic data, home addresses, school enrollment information, achievement data, and in many cases disciplinary records for each student enrolled in each school in the district. A unique student identifier links student records across years of data, enabling us to examine student mobility and student outcomes over time. The databases will also include school-level information, such as enrollment by race and poverty status, and staff and teacher characteristics, e.g. years of experience, credential status, and education level when available.

We have purchased foreclosure data in California for San Diego and San Joaquin (Fresno) counties from Dataquick, and plan to purchase the Florida foreclosure data from RealtyTrac. Home purchase and refinance data will be purchased from Dataquick for both California and Florida, and will be supplemented with data collected under the Home Mortgage Disclosure Act (HMDA). Using GIS software, we will identify students who actually experienced a foreclosure or an eviction due to foreclosure of a rental property by linking addresses from the foreclosure data to student home addresses and measure the frequency of foreclosures in every census tract and block group. Finally, we will assign student addresses to additional community level variables, such as measures of local school quality, neighborhood racial composition, home prices, employment rates, crime, air quality, and land use using public data sets.

We will exploit the longitudinal nature of the student and community data to employ fixed effects strategies for examining the neighborhood environments (Aim 1) and outcomes for youth who are exposed to high neighborhood foreclosure rates (Aim 2) or experience displacement due to foreclosure (Aim 3). Changes in community characteristics will be compared across neighborhoods with differing housing market experiences and foreclosure rates during the foreclosure crisis, but similar prior neighborhood environments. Similarly, changes in youth education outcomes will be compared to baseline changes in outcomes of youth attending the same school who reside in neighborhoods with different foreclosure rates. The longitudinal nature of the sample allows us to control for the selection of students into neighborhoods by controlling for measures of ability and behavior prior to the onset of the foreclosure crisis. Specifically, we will implement a differences-in-differences identification strategy by controlling for students' prior achievement, innate ability, and family environment using student performance on standardized test scores in earlier grades and family background variables like free lunch status before the onset of the crisis. Therefore, we can compare changes in student outcomes over time for students that reside in neighborhoods with deteriorating housing markets and high foreclosure rates to changes in outcomes for students who attend the same school, but reside in neighborhoods that were less affected by the recent crisis; similarly, we will compare changes in outcomes for students who experienced a displacement due to foreclosure to those for students residing in the same neighborhood who did not.

Finally, we will explore the robustness of our differences-in-differences approach using an instrumental variable strategy, where we use housing and mortgage market circumstances prior to the foreclosure crisis to develop instruments for neighborhood foreclosure rates and for actual foreclosure of particular mortgages. Specifically, for Aims 1 and 2, we will use past housing price appreciation rates and average mortgage terms, such as the loan to value ratio, to develop instruments for the recent increase in neighborhood foreclosure rates. For Aim 3, we will interact the terms of an individual's or their landlord's current mortgage with housing price appreciation rates to predict the likelihood of individual families experiencing foreclosure relative to others residing in their neighborhood. These instruments—especially an individual's loan terms—are unlikely to be completely exogenous to neighborhood and individual unobservables. However, the controls for previous student outcomes will be drawn from the same period as the housing and mortgage market instruments, so we expect to capture individual and neighborhood level unobservables that affect future student outcomes but may be correlated with past neighborhood or individual housing and mortgage market outcomes.

Literature Review and Research Context. The recent housing bust and subsequent foreclosure crisis introduced profound changes in the lives of affected youth, their families, and communities. Yet, many of these effects have not been documented or measured, in large part due to the difficulty of tracking families who have experienced displacement due to foreclosure. To date, no studies have examined the direct and indirect effects of foreclosure on the well-being of families and their children.

A wide variety of research has investigated outcomes for families who experience residential displacement. Research in developmental psychology indicates that children are highly sensitive to changes in their immediate environments (e.g., Duncan, Brooks-Gunn, and Klebanov 1994). Most directly, Haveman, Wolfe, Spaulding (1991), Pribesh and Downey (1999), and Hanushek, Kain, and Rivkin (2004) find differences in academic achievement between students who experienced a residential move and students who did not, and Schafft (2002) finds negative impacts in schools where mobility rates are high. Pettit and McLanahan

(2003) and Pribesh and Downey (1999) find that residential mobility reduces the quality of children's social networks. These concerns are exacerbated by recent findings that black, Hispanic, and poor students are the most likely to switch schools (Schwartz, Stiefel and Chalico, 2007). Finally, financial stress and foreclosure are likely to create substantial discord in adult relationships (including both marital and cohabitating relationships) and possibly lead to dissolution of those relationships; such discord and separation in adult relationships can have negative impacts on children's education and early life outcomes (Amato and Sobolewski, 2001; Cavanagh, Schiller, and Riegle-Crumb, 2006; Fomby and Osborne, 2009; Osborne and McLanahan, 2007).

Other studies document the positive effects of homeownership on both family and children's outcomes directly, as well as its indirect effects on neighborhood quality. Aaronson (2000), Braconi (2001), Boyle (2002), and Galster et al. (2003) find that homeownership is associated with higher rates of high school completion. Haurin, Parcel, and Haurin (2001) find a positive effect on test scores, and Boyle (2002) and Haurin, Parcel, and Haurin (2001) find a positive effect on student behaviors. Ellen et al. (2001) find that property values near new owner-occupied housing developments rise faster than values in comparable areas. DePasquale and Glaeser (1999) find that homeowners invest more in social capital, possibly improving social networks in neighborhoods. Rohe and Stewart (1996) and Rosenthal (2008) find greater neighborhood stability when homeownership rates are high. Finally, Galster (1987) discusses the link between homeownership and physical investments in housing stock and neighborhoods.

As with homeownership, it is likely that property foreclosures not only impact the families residing in foreclosed properties, but also affect students and neighborhoods more broadly. First and foremost, foreclosures may erode neighborhood property values due to lower priced foreclosure sales and a glut of unsold homes (Schuetz, Been, and Ellen, 2008), and falling housing prices and risk of foreclosure may lead to declines in home maintenance (Campbell, Giglio, and Pathak, 2009). Further, if foreclosures affect the quality of the surrounding neighborhood—for example, through an increase in crime as documented by Immergluck and Smith (2005)—the academic outcomes and behaviors of students may be adversely affected, either directly or indirectly through the outcomes of their parents. For example, the Moving to Opportunity Study finds that residing in communities with more desirable amenities has long-run positive impacts on the mental health of mothers and the academic and behavioral outcomes of their female children (2007). Case and Katz (1991) find that the behaviors of children are affected by the behaviors of their neighborhood peers, including criminal activity, drug and alcohol use, childbearing out of wedlock, and schooling. Further, Glaeser, Sacerdote, and Scheinkman (1996) attribute the concentration of crime into neighborhoods to social interactions between residents. Bayer, Ross and Topa (2008) find that access to neighborhood social networks improves adult labor market outcomes. Finally, research in education finds that the behaviors and environments of a student's peers, which might be affected by high foreclosure rates, likely influence a student's own outcomes and behaviors (Calvo-Armengol, Patacchini, and Zenou, In Press; Carrell and Hoekstra, In Press; Lavy and Schlosser, 2007; Weinberg, 2006).

Yet while job loss and other negative income shocks likely explain the majority of foreclosures historically, the current foreclosure crisis is driven by a more complicated mechanism (Kingsley, Smith, & Price, 2009). Now, families may enter foreclosure because they obtained a high cost mortgage they can no longer afford—such as a subprime, variable rate, or interest-only loan—and are unable to make monthly payments after the interest rate re-sets, and/or cannot refinance the loan into a lower cost alternative (Edmiston and Zalneraitis, 2007).

Further, the rapid expansion of the subprime market and declines in underwriting standards during the housing boom made credit available to many borrowers with weak credit histories and insufficient or unreliable income streams (Bhardwaj and Sengupta, 2008). When house values decline, households may also strategically default on their mortgages and go into foreclosure even if they could afford to continue making monthly mortgage payments (Geanakoplos & Koniak, 2009). Declines in housing prices also put households at risk of foreclosure in the face of moderate income shocks because the consumption sacrifices typically made to avoid foreclosure are far less attractive when a household has no equity to preserve (Foote et al. 2008). Finally, the foreclosure crisis also has displaced an unprecedented number of renters, particularly those who live in properties purchased as speculative investments during the housing boom. Tenant rents may be insufficient to cover the landlord's monthly mortgage payment, and landlords face the same economic incentives to default when they have no equity stake. Recent estimates find that rental properties comprise approximately 38 percent of all foreclosures (Pelletiere & Wardrip, 2008).

These recent housing market dynamics suggest that families and children experiencing displacement due to foreclosure are systematically different from those who have experienced residential displacement due to negative income shocks. Households displaced due to foreclosure may not always face the same economic challenges if they can in theory afford to continue making mortgage payments, yet choose to strategically default. On the other hand, there is reason to believe that households displaced due to foreclosure may suffer more profound consequences than households forced to move as a result of economic misfortune. While both groups suffer the consequences of residential instability, foreclosure is particularly damaging to households' long-term financial stability. Foreclosures damage credit history, which can have a lasting impact on families' ability to afford housing in the future: families with lower credit scores pay significantly higher mortgage rates and will have greater difficulty meeting renter qualifications (Ross & Yinger, 2002). One study in the mid-1990s found that the average family facing foreclosure lost more than \$7,200 in home equity (Moreno, 1995). Damaged credit histories can also affect employment opportunities, drive up insurance rates, and increase other household costs, such as required deposits for utilities (Nelson, In Press). Despite the distinction between families affected by foreclosure and families facing involuntary displacement for other reasons, we know very little about the effects of such displacement on either group.

Further, the subprime boom and the foreclosure crisis have had much larger effects on minority borrowers and the neighborhoods in which minority borrowers reside. Calem, Gillen, and Wachter (2004), Calem, Hershaff, and Wachter (2004), and Immergluck and Wiles (1999) find higher rates of subprime lending in minority and low income neighborhoods, and Pennington-Cross, Yezer, and Nichols (2000) find that FHA lending, a traditional source of credit for minority borrowers, lost greater market share to subprime lending in highly segregated metropolitan areas. Bocian, Ernst, and Lee (2006) found racial differences in the likelihood of receiving a high cost loan even after controlling for standard risk variables like borrower credit history and loan to value ratio. Also, residents in minority neighborhoods are much more likely to be the victims of predatory lending practices, including equity stripping, single premium life insurance, abusive prepayment penalties, fraudulent underwriting practices and very high levels of broker compensation (Stein, 2001; Stein and Libby, 2001; Farris and Richardson, 2004, Dearborn, 2003). As a result, foreclosure rates have been much higher among minority borrowers and in minority neighborhoods leading up to and during the foreclosure crisis (Gerardi and Willen, 2009; Jiang, Nelson, & Vytlačil, 2009; Immergluck and Smith, 2004; Gruenstein and

Herbert, 2000). None of these findings should be entirely surprising given the history of racial discrimination and mortgage redlining in prime mortgage markets within the U.S. (Munnell et al. 1996; Ross & Yinger, 2002; Ross et al. 2008; Tootell, 1996; Ross and Tootell, 2002).

This study will shed light on how foreclosures impact youth, their school and community settings, and their education outcomes. Generally, there is too little causal evidence documenting how the lives of young people are affected by displacement, and there is no information available about the effects of foreclosure. As discussed earlier, we know that school and neighborhood settings matter for youth outcomes, and that foreclosures are concentrated in neighborhoods with large numbers of disadvantaged students. Yet, we do not understand the broader effects of foreclosures on school and community settings, and how changes in these settings impact student outcomes. Finally, we know that racial minorities are more exposed to segregation, lower quality schools, higher crime rates, and other negative community characteristics (Bifulco, Furtado, and Ross 2009; Nelson, 2009), and minorities and the neighborhoods in which they reside have been exposed to much higher rates of foreclosure. However, we know little about the potential feedback effects that might occur within neighborhoods and schools which might magnify the effects of high foreclosure rates. Taken together, the existing literature suggests that the effects of foreclosure may disparately impact minority households, thereby exacerbating existing achievement gaps and patterns of neighborhood and school segregation.

In the context of the existing literature, the proposed study will be the first to examine both the effects of foreclosure and of living in neighborhoods with high foreclosure rates on youth settings and education outcomes. It is the first study to explicitly estimate the effects of foreclosure on a comprehensive set of school and community characteristics, and to provide direct evidence about the extent to which such effects disparately impact vulnerable (minority and low-income) youth in particular. Specifically, it is the first study to longitudinally track the education outcomes of youth displaced by foreclosure, and to examine how local school and community settings mediate these outcomes.

Hypotheses. This section provides more precise research questions for our three major aims. In the statistical analyses, we will set up formal null hypotheses that community attributes or student performance are unaffected by foreclosure and test for rejection of these hypotheses.

Aim 1. Impact of Neighborhood Foreclosure Rates on Community and School Characteristics.

Hypothesis 1a. Do community attributes, such as school quality, crime rates, employment opportunities and residential segregation, experience greater deterioration during the subprime crisis in communities that have unusually high foreclosure rates after controlling for community attributes prior to the crisis?

Hypothesis 1b. Do high foreclosure rates contribute to the deterioration of these community characteristics where the causal impact of foreclosure is captured by the mortgage and housing market circumstances prior to the subprime crisis?

Hypothesis 1c. Does the effect of foreclosure rates on community attributes vary based on whether the foreclosures are against rental or owner-occupied properties?

Aim 2. Impact of Neighborhood Foreclosure Rates on Education Outcomes of Students

Hypothesis 2a. Do students residing in neighborhoods with high foreclosure rates experience worse outcomes, as captured by test scores, disciplinary records, attainment, attendance, and school changes, than other students at the same school after controlling for student outcomes and family background observed prior to the subprime crisis?

Hypothesis 2b. Do high neighborhood foreclosure rates contribute to declines in student outcomes where the causal impact of foreclosure is captured by the mortgage and housing market circumstances prior to the crisis?

Hypothesis 2c. Does the effect of foreclosure rates on student outcomes vary based on whether the foreclosures are against rental or owner-occupied properties?

Aim 3. Impact of Home Foreclosure on Education Outcomes of Students Displaced by a Foreclosure.

Hypothesis 3a. Do students displaced by a foreclosure experience worse outcomes, as captured by test scores, disciplinary records, attainment, attendance, and school changes, than other students residing in the same neighborhood and attending the same school after controlling for student outcomes and family background observed prior to the subprime crisis?

Hypothesis 3b. Does displacement by a foreclosure contribute to a decline in student outcomes relative to the outcomes of other students residing in the same neighborhood and attending the same school, where the causal impact of foreclosure is captured by the mortgage and housing market circumstances prior to the crisis?

Hypothesis 3c. Does any effect of neighborhood foreclosure rates on student outcomes remain after controlling for the direct effect on students of being displaced by a foreclosure?

Hypothesis 3d. Does the effect of displacement due to a foreclosure on student outcomes vary based on whether the foreclosure is against a rental or owner-occupied property?

Research Design and Methods

Models of Community and School Characteristics. In order to address Aim 1, we will estimate a series of models on a sample of neighborhoods or school attendance zones (j) in each subject county or school district that relate changes in their characteristics to changes in foreclosure. Specifically, we will consider an initial model of community characteristics that takes the following simple form:

$$y_{jt} = \beta Z_{jt} + \delta_j + \varepsilon_{jt} \quad (1)$$

where y_{jt} is a community attribute that can vary over time, Z_{jt} is a foreclosure rate, and δ_j captures time invariant attributes of a community that influence the time varying attribute. δ_j might influence community attributes by affecting who resides at a given location or by changing the incentives and opportunities faced by those residents, and therefore is likely to be correlated with neighborhood foreclosure rates. Note that ε represents the idiosyncratic random error associated with an individual observation in equation (1) and in all model specifications that follow.

In this simple model, differencing over time eliminates δ_j and can mitigate bias associated with estimating the relationship between foreclosure rates and time varying community attributes (like neighborhood racial and ethnic composition or average student performance). Specifically,

$$y_{jt} - y_{jt-k} = \beta(Z_{jt} - Z_{jt-k}) + (\varepsilon_{jt} - \varepsilon_{jt-k}) \quad (2)$$

where data from k years earlier is used for differencing and k is chosen so that the earlier information comes from a period that substantially precedes the onset of the foreclosure crisis.

However, simple differencing may not entirely eliminate the role of time invariant community attributes. The relationship between time varying community attributes and time invariant attributes may change over time, especially given the dramatic housing and mortgage market changes that occurred leading up to and during the foreclosure crisis. For example, primarily owner-occupied neighborhoods with older housing near poorer urban areas might have maintained high homeownership rates and stable neighborhood incomes during relatively calm

economic circumstances, but began a transition towards lower income, rental neighborhoods during the crisis. Under such circumstances, it makes sense to use information from any observable community attributes at time $t-k$ that might proxy for or be influenced by important time invariant community attributes. So, equation (1) is written by replacing δ_j with such a function

$$y_{jt} = \beta Z_{jt} + f(y_{\underline{j}t-k}, Z_{t-k}, X_j) + \varepsilon_{jt} \quad (3)$$

where the $y_{\underline{j}t-k}$ represents the vector of all time varying community attributes measured at time $t-k$ and X_j contains any observable time invariant community attributes. We will use a propensity scoring approach to generate the function f where we regress foreclosure on observables using a simple linear model (Dehejia and Wahba, 2002; Rosenbaum and Rubin, 1983)

$$Z_{jt} = \phi y_{\underline{j}t-k} + \varphi Z_{t-k} + \gamma X_j + \mu_{jt} \quad (4)$$

The predicted values arising from the estimated parameters in equation (4) capture the best linear prediction of foreclosure rates in location j , given information available at time $t-k$. We will use this information to construct dummy variables ($\hat{\delta}_{Z_{t-k}}$) associated with locations that have similar propensity scores/predicted foreclosure rates, and these dummy variables will assure that the effect of foreclosure on community attributes is identified by comparing communities or locations that were observationally similar at time $t-k$ on expected foreclosure rates.

$$y_{jt} = \beta Z_{jt} + \hat{\delta}_{Z_{t-k}} + \varepsilon_{jt} \quad (5)$$

Finally, even after controlling for time invariant community attributes, estimates may be biased because events following time $t-k$ influence both community attributes y_{jt} and foreclosure rates Z_{jt} . To address this concern, we will pursue an instrumental variables strategy where Z_{jt} is predicted by circumstances in the mortgage and housing market at time $t-k$ that likely contributed to foreclosures during the crisis, but were unlikely to be directly related to changes in community composition. Specifically, community averages of mortgage attributes like the loan-to-value ratio and share of cash-out refinances—along with the interaction of those variables with neighborhood housing price appreciation leading up to the crisis—will be excluded from the creation of the fixed effects $\hat{\delta}_{Z_{t-k}}$, but used to predict foreclosure rates in a standard two stage instrumental variables specification. A notable feature of this identification strategy is that our mortgage-based instruments should not be correlated with later events that are the source of bias being addressed by the instrumental variables strategy. Because the instruments are intentionally drawn from the same time period as the lagged community attributes, they should not be influenced by factors that are not captured by the community fixed effects, $\hat{\delta}_{Z_{t-k}}$. In addition, tenure-specific instruments can be developed for foreclosure rates on owner-occupied and investment properties using the average mortgage terms for these two types of properties separately.

Models of Student Outcomes and Behaviors. For Aims 2 and 3, we implement differences-in-differences strategies rather than relying on a single fixed effect as described in the prior section for Aim 1. For Aim 2, we will examine changes in outcomes of youth attending the same school who reside in neighborhoods with different foreclosure rates, while for Aim 3 we will compare changes in outcomes for youth experiencing displacement due to a foreclosure to changes for youth who reside in the same neighborhood and attend the same school, but do not experience a foreclosure.

As a benchmark, we will start with a standard value-added model of academic outcomes used extensively with school district administrative data (Hanushek, Rivkin and Kain, 2005; Clotfelter, Ladd and Vigdor, 2006; Figlio and Rouse, 2006).

$$y_{ist} = \alpha y_{ist-k} + \lambda X_{is} + \eta W_{st} + \varepsilon_{ist} \quad (6)$$

where y_{ist} is typically either a standardized test score or year to year gains in the test scores, X_{is} contains student attributes including family background and W_{st} contains school attributes. Many of these studies replace some individual covariates with some combination of student, school, or teacher fixed effects. See Figlio (2006) for an example of how these specifications can be adapted to consider disciplinary outcomes as a function of past academic achievement.

For Aim 2, this model is extended to include neighborhood foreclosure rates (Z_{nt}) at time t , observed and unobserved school variables are captured by school fixed effects δ_s , and the vector of student information is taken from period $t-k$ and extended to include neighborhood attributes including foreclosure rates from $t-k$.

$$y_{inst} = \beta Z_{nt} + \alpha y_{ist-k} + \lambda X_{inst-k} + \delta_s + \varepsilon_{inst} \quad (7)$$

This yields a model specification that identifies the effect of neighborhood foreclosure rates on student performance, using within school variation after conditioning on past student performance and past foreclosure rates. The school fixed effects eliminate bias arising from any correlation between school inputs or environment and the types of students attending schools that service the residents of high foreclosure rate neighborhoods. The inclusion of school fixed effects, however, can create bias associated with differences between students who attend or select into the same school, but differ on other factors like neighborhood choice (Bayer and Ross, 2008). This second bias is mitigated by controls for lagged student performance.

For Aim 3, the model in equation (6) is extended in a similar way, except the variable of interest is whether the student was displaced by a foreclosure. Fixed effects are used to assure that comparisons are made within the same neighborhood and school:

$$y_{inst} = \theta D_{inst} + \alpha y_{ist-k} + \lambda X_{inst-k} + \delta_{ns} + \varepsilon_{inst} \quad (8)$$

where D_{inst} captures whether a student experienced a foreclosure-forced displacement and X_{inst-k} does not include neighborhood variables since they are captured by δ_{ns} , which includes both school and neighborhood fixed effects.

Further, neighborhood fixed effects ($\hat{\delta}_{nst}$) associated with current student performance can be estimated using the model estimates provided from equation 8, and these fixed effects will be used in a second stage estimation to test whether any correlation between student performance and foreclosure rates remains after controlling for the direct effect of student displacement.

$$\hat{\delta}_{nst} = \beta Z_{nt} + \varepsilon_{nst} \quad (9)$$

See Bayer, McMillen, and Ferreira (2008) for an application of this two stage approach in a neighborhood choice context.

As with the community models, estimates may be biased even after controlling for lagged individual and neighborhood attributes, because neighborhood events following time $t-k$ influence both student performance y_{jt} and foreclosure Z_{jt} or D_{inst} . To address this concern, we will again instrument for Z_{jt} using average circumstances in the mortgage and housing market at time $t-k$, and will instrument for D_{inst} using whether an individual (landlord) purchased or refinanced their home (investment property) during the period leading up to the subprime crisis, the terms of the specific mortgage obtained at that time, and interactions between these mortgage

variables and past housing appreciation rates. As above, tenure-specific instruments can be developed using mortgage terms specific to each property type.

Samples and Data

Samples. This study employs data from two to three geographic areas that meet four criteria: (1) exposure to the housing crisis (i.e., rapid home price depreciation coupled with high foreclosure rates in recent years), (2) availability of public record foreclosure data, (3) availability of district administrative databases which track students longitudinally using a unique identifier, and (4) willingness of the school district to provide student residential address data. Specifically, we chose to focus on school districts in California and Florida because those states currently rank first and second highest in the number of foreclosure filings and have both experienced dramatic declines in housing prices over the last few years. Further, foreclosures in California are tracked through the property recorder system which provides complete historical coverage; in Florida, a private foreclosure vender that works with RealtyTrac has been capturing county courthouse foreclosure records in major Florida counties since early in the decade.

Specific school districts were also selected based on data availability. In California, San Diego and Fresno School Districts were selected because these districts are two of only a small number of school districts that track student performance over time, and both districts have expressed a willingness to provide student residential address data along with the more standard longitudinal student performance data. In Florida, most districts have longitudinal student data, but few districts have been willing to include student residential addresses with this data. Pinellas County School District has been an exception. The San Diego City School District and the Pinellas County District have both agreed informally to provide longitudinal student data along with student residential addresses. Both districts, however, have established processes and reviews that are required for formal approval; these reviews are always conducted in the fall once school is in session. We have obtained research sponsorship from an individual in the San Diego City School District (see attached email). Professor Figlio has a long-standing relationship with Pinellas County School District, and currently has access to longitudinal student data with student addresses from Pinellas through the 2005-06 school year. Fresno Unified has also expressed interest, but we are still completing their formal research application process (see attached email). Professor Nelson has obtained funds to compensate the California districts for data processing costs and has also purchased foreclosure data for San Diego and San Joaquin Counties from Dataquick using a seed grant provided by her university. We expect to begin preliminary work with data from San Diego and possibly Fresno this fall.

We will create several distinct samples from this data. The first samples are designed to support Aim 1, and these samples will be samples of zip codes, census tracts or block groups, and schools. The samples will contain all locations in each county being studied except for the California school samples. In California, school districts do not encompass the entire county, so school attendance zones will only be available within our subject school districts. Each sample will contain foreclosure rates and neighborhood or school attributes both from a period preceding the crisis (from approximately 2000-2004), and during the subprime crisis (from approximately 2007-2009), as well as geographic or physical attributes of these places that are fixed over the time period. The final sample is of students observed in the school district itself during the period preceding the crisis; this sample will contain student outcome data during the entire period, student demographics and family background characteristics, foreclosure experiences, and will identify the schools attended and neighborhoods of residence during the study period.

Foreclosure and Mortgage Data. Dataquick and RealtyTrac will provide the detailed addresses associated with all notices of foreclosure and all foreclosure sales for the subject counties in California and Florida, respectively. Dataquick will also provide a history of all transactions and liens associated with each property in each county. Using these data, we will estimate the total number of active mortgages in each geographic area, and calculate three different foreclosure rates: fraction of mortgages receiving a notice of foreclosure, fraction of mortgages resulting in a foreclosure sale, or fraction of mortgages resulting in either a foreclosure or short sale where short sales are identified as sales where the housing unit sold soon after a foreclosure notice and/or for less than our estimate of the outstanding mortgage balance. Finally, the addresses of foreclosure notices, foreclosure sales, and short sales will be linked to the residential addresses of students reported prior to foreclosure. Displacement will be verified based on a change in the student's residential address for the next academic year.

The Dataquick history of transactions and liens will also be used to characterize the housing and mortgage markets in each neighborhood prior to the onset of the foreclosure crisis. The history file captures all housing transactions, allowing us to estimate trends in housing prices for various neighborhoods in each county using standard non-parametric smoothing techniques (Clapp, 2004; McMillen, 2003). The Dataquick history files record all liens on a property, providing a clear picture of an individual's equity stake or loan-to-value ratio, which is not available in most loan-based samples. The long history will also allow us to observe the initial purchase or earlier refinances for most mortgages issued during the last decade, and we will use this information to identify cash out refinances where the outstanding loan amount exceeds expected mortgage debt prior to the refinance.

The Home Mortgage Disclosure Act data (HMDA), which is available at the University of Connecticut, is a practical census of all mortgages which includes demographic and economic information on the borrower, loan amount, whether the mortgage purpose is for purchase or refinance, whether the property is owner-occupied or used as an investment property, and data identifying both the lender and census tract in which the property is located. Prior to 2005, the Department of Housing and Urban Development provided a subprime lender list that can be linked to HMDA, allowing us to calculate the fraction of loans made by subprime lenders in any census tract. From 2005 forward, every HMDA loan has a rate spread variable that identifies that loan as a high cost (subprime) loan based on the spread between the mortgage interest rate and the rate on U.S. treasury notes. This information will allow us to characterize the market share of subprime lenders or lending in census tracts overall as well as by demographic group or property type.

Neighborhood and School Data. Neighborhood demographic and economic data at the census tract and/or census block group level will be drawn from data provided by the U.S. Census. Specifically, the SF3 tables of the 2000 Decennial Census drawn from the census long form data will be used to measure neighborhood variables like racial and ethnic composition, poverty rates, unemployment, and population density in order to describe neighborhoods in the period prior to the subprime boom and subsequent foreclosure crisis. Change in neighborhood composition and environment will be captured using data from the American Community Survey, which replaces the Decennial Census long form after 2000. Census tract and block group data based on the American Community Survey and similar to the SF3 tables will be released in late 2010 based on a weighted average of data collected between 1995 and 1999. In addition, we will obtain zip code level annual average household income information from the Internal Revenue Service's Individual Master File system.

School attendance zone maps will be provided by the subject school districts and when necessary, physical maps will be digitized at the University of Connecticut. Any limitations in the final digital attendance zone maps will be addressed by drawing on the spatial patterns of student attendance that can be observed using the student address data. Professor Ross has worked extensively with student address data and GIS maps of school attendance zones for Durham, NC. We will characterize schools using publicly available state education datasets that provide the following variables at the school level: average achievement levels by grade and demographic group, percent of students enrolled in free and reduced lunch programs (a measure of student poverty), percent of English Language Learner (ELL) students, percent of teachers with full credentials, average years of teacher experience, and the ratio of full-time-equivalent staff per student. We will also include high school completion rates for each high school in these districts. We will supplement this data by aggregating information from the student level data.

Further, student level data in combination with student addresses will be used to characterize the composition of school attendance zones on similar variables. While the school attendance zone boundaries will only be available within our subject school districts, we will experiment with extending this analysis to the entire county using the aggregate school data from public data sources and using GIS analysis to create pseudo attendance zones by assigning census blocks to schools based on proximity (Bayer, McMillan, and Rueben, 2004).

Current crime statistics will be collected at the lowest level of geography available. For California, San Diego and San Joaquin Counties both have on-line GIS systems that provide crime statistics at the zip code level. While Pinellas county crime statistics are only compiled publically at the municipality level, the Pinellas county sheriff's department provides upon request neighborhood specific crime reports to neighborhood residents. Given that Florida is an open records state, we anticipate being able to work with the sheriff's department to obtain crime data at a lower level of aggregation, such as zip code. We will also construct sub-indices to separately measure violent crime (homicide, rape, and robbery) and property crime (burglary, larceny and motor vehicle theft) in each zip code or neighborhood.

Note that we cannot statistically model measures of segregation, such as a dissimilarity index, using our samples because segregation measures are created by aggregation up from lower levels of geography, and so such a statistical analysis would require measures of segregation for a sample of many school districts or counties. However, we will examine whether the impact of foreclosures on a neighborhood's or attendance zone's demographic composition varies with the original composition so that we can detect whether more racially or ethnically isolated places see an increase in isolation when exposed to high foreclosure rates.

Additional data will be collected primarily for the purpose of characterizing locations prior to the foreclosure crisis. The California and Florida Private School Directories provide the locations of all private schools in each state. Each neighborhood will be assigned a measure of private school availability, which is a count of private schools located in the neighborhood or within a set distance of the neighborhood center. The Fire and Resource Assessment Program (FRAP) datasets provide geocoded information on land usage, and can be used to calculate the percent of high intensity urban land usage within neighborhoods. Finally, we will collect the 100-year historical average of July high temperatures for all weather stations in the subject counties using Rand Data and collect daily observations of the proportional levels of six air pollutants for all pollution monitoring stations using Environmental Protection Agency data. Following Bayer (2001), we will calculate the average daily level of each air pollutant for every monitoring station over time and construct a measure of relative air quality by dividing the level

of environmental quality by the average level for all monitoring stations. The arithmetic mean of the relative air quality measures will be used to construct an overall pollution index. Stations that do not measure all six air pollutants are assigned the average of the relative air quality measures for the air pollutants that are measured at the same station. We will assign weather and air quality data using the latitude and longitude coordinates for weather and pollution monitoring stations; each housing choice is assigned to weather and pollution data recorded by the nearest three weather and pollution monitoring stations, where the weights are the inverse of the distance between the monitoring station and the house.

Finally, while our neighborhood/school data is available for differing geographic definitions, we will be able to use any of our lagged neighborhood variables as controls for each of our samples. We will accomplish this using GIS software in order to identify overlapping pieces for any two geographic decompositions of a county or school district, e.g. census block group and school attendance zone. These overlapping pieces can be used to identify the fraction of one geographic element, a census tract, that falls inside another element, a school attendance zone; then, that fraction of the census tract's population count overall and by demographic group is assigned to the attendance zone. The demographic composition for the attendance zone is then calculated by combining the estimated populations from all pieces of census tracts that fall inside the zone. This estimation strategy is similar to strategies used by Geolytics Inc. and by Rosenthal (2008) to develop geographically consistent census data between decennial censuses.

School Administrative Data. The school district administrative databases will include student-level demographic data (race, poverty or free lunch eligibility, and English Language Learner status), home addresses, school enrollment information, achievement data, graduation records, and in many cases disciplinary records for each student enrolled in each school in the district. A unique student identifier links student records across years of data, enabling us to examine student mobility and student outcomes over time. Further, the district provided information will allow us to link detailed information on teachers assigned to a specific grade to the students enrolled in that grade of a school for that year. As discussed above, student address data will be used to assign students to neighborhoods based on zip code, census tract, block group, and school attendance zone, allowing us to link students to all aggregate neighborhood and school variables and to match students to properties where a foreclosure notice is received and where either a foreclosure or short sale occurs.

Protection of Human Subjects. Given the identifiable student address data we plan to use in this study, a plan must be prepared for protecting human subjects and approval is necessary from each institution's Internal Review Board for the Protection of Human Subjects (IRB). Each of the Principal Investigators is in the process of obtaining Human Subjects approval from the Institutional Review Boards at our respective universities. No grant funds will be released by the University of Connecticut until Connecticut's IRB has approved the plan, and funds will not be released to the subgrantees until each university's IRB has also approved the plan. Finally, Pinellas County School District has its own internal IRB process, which is in progress and should be completed when the committee meets this fall.

In a project of this sort where there is no direct interaction with Human Subjects and no personal information is directly related to health status or provision of medical services, the protection of human subjects typically relies on policies that secure the data with personally identifiable information and that limit the release of analysis and results to aggregations and estimated parameters that cannot reveal information about an individual. In order to secure the data, we will establish and enforce policies so that data is only stored on password protected

computers or on back-up devices that are secured in locked private offices when not being used. In addition, we will only release means, standard deviations, and model estimates based on substantial samples of individuals so that the figures released never provide meaningful information on a single person or even a small set of people in the sample.

All three Principal Investigators have experience working with longitudinal student data and have completed numerous IRB applications for using administrative data in which individuals might be identified. Professor Figlio is the Florida site director for the National Center for the Analysis of Longitudinal Data in Education Research, and so has extensive experience with issues of human subjects research related to exactly the type of data that will be used in this proposal. Professor Ross is a Special Sworn Status researcher for the Center of Economic Studies at the Census Bureau and as such has access to highly sensitive Decennial Census and Internal Review Service data in secure census data centers, and receives regular census training on the protection of confidential data.

Policy Significance. Results from the proposed studies will provide much-needed evidence to inform both the nature and level of policy supports aimed at families facing foreclosure or eviction, and have the potential to inform a range of policies aimed at improving the lives and settings of youth.

The federal and state policy response to the foreclosure crisis is unprecedented, with lawmakers proposing everything from enhanced loan modification programs to a nationwide moratorium on foreclosures. While most legislators agree that helping families avoid foreclosure is a worthy goal, there is disagreement about the nature of support that families facing foreclosure need, as well as the level of financial and other assistance that the government should provide. At the same time, we know little about the long-term effects of foreclosure on families, children, and communities, making it difficult to assess how policy should support foreclosure avoidance rather than other initiatives, such as affordable housing programs, unemployment assistance, and enhanced social services, which could support families in foreclosure as well as others affected by the recession. Further, policy efforts aimed at reducing foreclosures have met with only limited success, raising questions of whether the policy mechanism or the level of support provided is deficient. For example, a recent Federal Deposit Insurance Corporation evaluation found that 55 percent of modified loans re-defaulted within six months.

In the proposed study, we examine how foreclosures impact families and children beyond the loss of home, thereby clarifying the broader effects of foreclosure and providing justification for broader support of programs aimed at remediating foreclosure and its effects. The findings could be used to inform the Obama Administration's \$275 billion Making Home Affordable Plan, which plans to curb foreclosures by offering incentives to mortgage lenders that provide borrowers with low-cost refinances or loan modifications. For example, the plan could provide larger incentives for modifying mortgages or protecting rental leases held by families with children enrolled in K-12 public schools. The findings could also support the case for foreclosure legislation aimed at providing financial and legal protection to families, for example, by decreasing the tax burden on families receiving loan principal forgiveness, by revising the Real Estate Settlement Procedures Act of 1974 to require more effective loss mitigation by mortgage servicers, or by providing eviction protection for renters of foreclosed properties.

Finally, results from the study could inform how stimulus funds allocated under the American Recovery and Reinvestment Act (ARRA) could be used to mitigate the effects of foreclosure. For example, school districts could apportion additional Title 1 funds to provide

instructional supports to students displaced by foreclosure, or provide after-school programs for children living in areas of high foreclosure who are more exposed to crime.

References

- Aaronson, D.. (2000). A note on the benefits of homeownership. *Journal of Urban Economics* 47(3):356–369.
- Amato, P.R. & J.M. Sobolewski. (2001). The Effects of Divorce and Marital Discord on Adult Children's Psychological Well-Being. *American Sociological Review* 66:900-921.
- Baker, D., Pelletiere, D., & Rho, H.J. (2008). *The Cost of Maintaining Ownership in the Current Crisis: Comparison in 20 Cities*. Washington, DC: Center for Economic and Policy Research and National Low Income Housing Coalition.
- Bhardwaj G. & R. Sengupta. (2008). Where's the smoking gun? A study of underwriting standards for US subprime mortgages. Federal Reserve Bank of St. Louis Working Paper. <http://ideas.repec.org/p/fip/fedlwp/2008-036.html>
- Bayer, P. (2001). Household Mobility, School Choices, and School Outcomes. *Proceedings of the Ninety-Third Annual Conference on Taxation*. Washington, D.C.: National Tax Association.
- Bayer, P., F. Ferreira, & R. McMillan. (2007). [A Unified Framework for Measuring Preferences for Schools and Neighborhoods](#). *Journal of Political Economy* 115(4): 588-638.
- Bayer, P., McMillan, R., & Rueben, K. (2004). *An equilibrium model of sorting in an urban housing market*. NBER Working Paper #10865. <http://www.nber.org/papers/w10865>
- Bayer, P. & S.L. Ross. (2008). Identifying Individual and Group Effects in the Presence of Sorting: A Neighborhood Effects Application. NBER Working Paper #12211. <http://www.nber.org/papers/w12211>
- Bayer, P., S.L. Ross & G. Topa. (2008). Place of Work and Place of Residence: Informal Hiring Networks and Labor Market Outcomes. *Journal of Political Economy* 116: 1150-1196.
- Bocian, D.G., K.S. Ernst, & W. Li. (2006). *Unfair Lending: The Effect of Race and Ethnicity on the Price of Subprime Mortgages*. Durham, NC: Center for Responsible Lending.
- Boyle, M.H. (2002). Home Ownership and the Emotional and Behavioral Problems of Children and Youth. *Child Development* 73(3):883–93.
- Braconi, F. (2001). *Housing and Schooling. The Urban Prospect*. New York: Citizen's Housing and Planning Council.
- Calem, P.S., K. Gillen, & S. Wachter. (2004). The Neighborhood Distribution of Subprime Mortgage Lending, *Journal of Real Estate Finance and Economics*, 29, 393-410.

- Calem, P.S., J.E. Hershaff, & S. Wachter. (2004). Neighborhood Patterns of Subprime Lending: Evidence from Disparate Cities. *Housing Policy Debate*, 15, 603-622.
- Calvó-Armengol, A., E. Patacchini, & Y. Zenou. (In Press). Peer effects and social networks in education. *Review of Economic Studies*.
- Campbell, J.Y., S. Giglio & P. Pathak (2009). [Forced Sales and House Price](#). NBER Working Paper #14866. <http://www.nber.org/papers/w14866>
- Case, A.C. & L. Katz (1991). [The Company You Keep: The Effects of Family and Neighborhood on Disadvantaged Youths](#) NBER Working Paper #3705 <http://www.nber.org/papers/w3705>
- Carrell, S. & M Hoekstra.(In Press). Externalities in the Classroom: How Children Exposed to Domestic Violence Affect Everyone. *American Economic Journal: Applied Economics*. http://www.econ.pitt.edu/papers/Mark_domesticviolence.pdf
- Cavanagh, S.E., K.S. Schiller & C. Riegle-Crumb. 2006. Marital Transitions, Parenting, and Schooling: Exploring the Link Between Family-Structure History and Adolescents' Academic Status. *Sociology of Education* 79:329-354.
- Clapp, J. (2004). [A Semiparametric Method for Estimating Local House Price Indices](#). *Real Estate Economics* 32(1): 127-60.
- Clotfelter, C.T., H.F. Ladd & J.L. Vigdor. (2006). Teacher-Student Matching and the Assessment of Teacher Effectiveness. *Journal of Human Resources* 41(4): 778-820.
- Dearborn, L. (2003). *Mortgage Foreclosures and Predatory Lending in St. Clair County*. Champlain, IL: East St. Louis Action Research Project.
- Dehejia, R.H., and S. Wahba. (2002). Propensity Score Matching for Nonexperimental Causal Studies. *Review of Economics and Statistics* 84: 151-161.
- DiPasquale, D. & E. Glaeser. (1999). Incentives and Social Capital. *Journal of Urban Economics* 45: 354-384.
- Duncan, G.J., J. Brooks-Gunn, & P.K. Klebanov. (1994). Economic Deprivation and Early Childhood Development. *Child Development* 65: 296-318.
- Edmiston, K. & Roger Zolneraitis. 2007. [Rising foreclosures in the United States: a perfect storm](#) . *Economic Review (Kansas City Fed)* 2007 Fourth Quarter: 115-145.
- Ellen, I.G., M. Schill, S. Susin, and A.E. Schwartz. (2001). Building Homes, Reviving Neighborhoods: Spillovers from Subsidized Construction of Owner-Occupied Housing in New York City. *Journal of Housing Research* 12(2): 185-216.

- Farris, J. and C.A. Richardson. (2004). The Geography of Subprime Mortgage Prepayment Penalty Patterns. *Housing Policy Debate* 15: 687-714.
- Figlio, D.N. (2006). Testing, Crime and Punishment. *Journal of Public Economics* 90(4-5): 837-851.
- Figlio, D.N. & C.E. Rouse. (2006). Do Accountability and Voucher Threats Improve Low Performing Schools. *Journal of Public Economics* 90(1-2): 239-255
- Fomby, P. & C. Osborne. (2009). The Relative Effects of Family Instability and Mother/Partner Conflict on Children's Externalizing Behavior. Princeton University Working Paper. <http://crew.princeton.edu/workingpapers/WP08-07-FF.pdf>
- Foote, C., K. Gerardi, L. Goette & P. Willen. (2008). Just the facts: An initial analysis of subprime's role in the housing crisis. *Journal of Housing Economics* 17(4):291-305.
- Galster, G. (1987). *Homeworkers and Neighborhood Reinvestment*. Durham, NC: Duke University Press.
- Galster, G., N. Gardner, M. Mandell, D.E. Marcotte, & H. Wolman. (2003). The Impact of Family Homeownership on Children's Educational Attainment and Earnings During Early Adulthood. George Washington University Working Paper. <http://www.gwu.edu/~gwipp/papers/wp004.pdf>.
- Geanokoplos, G., & Koniak, S.P. (March 4, 2009). Matters of Principal. *The New York Times*.
- Gerardi, K. & P. Willen (2009). Subprime mortgages, foreclosures, and urban neighborhoods. Federal Reserve Bank of Atlanta Working Paper. <http://www.frbatlanta.org/filelegacydocs/wp0901.pdf>
- Gruenstein, D. & C. Herbert. (2000). *Analyzing Trends in Subprime Originations and Foreclosures: A Case Study of the Boston Metropolitan Area*. Cambridge, MA: Abt Associates Inc.
- Rivkin, S.G., E.A. Hanushek & J.F. Kain. (2005). Teachers, Schools, and Academic Achievement. *Econometrica* 73(2): 417-58
- Hanushek, E., J. Kain, and S. Rivkin. (2004). Disruption versus tiebout improvement: The costs and benefits of switching schools. *Journal of Public Economics* 88(9):1721-46.
- Glaeser, E., B. Sacerdote, J.A. Scheinkman. (1996). [Crime and Social Interactions](#). *Quarterly Journal of Economics* 111(2): 507-548.
- Haurin, D.R., T.L. Parcel, & R.J. Haurin. 2001. The impact of homeownership on child outcomes. Harvard University Joint Center for Housing Studies Working Paper. <http://www.jchs.harvard.edu/publications/homeownership/liho01-14.pdf>

- Haveman, R., B. Wolfe, & J. Spaulding. (1991). Childhood Events and Circumstances Influencing High School Completion. *Demography* 28(1), 133-157.
- Immergluck, D., & Smith, G. (2006). The external cost of foreclosure: The impact of single-family mortgage foreclosures on property values. *Housing Policy Debate*, 17(6), pp. 57–79.
- Immergluck, D. & G. Smith. (2004). *Risky Business: An Econometric Analysis of the Relationship between Subprime Lending and Neighborhood Foreclosures*. Chicago: Woodstock Institute.
- Immergluck, D. & M. Wiles. (1999). *Two Steps Back: The Dual Mortgage Market, Predatory Lending, and the Undoing of Community Development*. Chicago: Woodstock Institute.
- Jiang, W., Nelson, A., & Vytlačil, E. (2009). Liar's Loan? Effects of Loan Origination Channel and Loan Sale on Delinquency. Columbia University Working Paper. http://www.columbia.edu/~wj2006/liars_loan.pdf
- Kalil, A., & Wightman, P. (2009). *Parental Job Loss and Children's Educational Attainment in Black and White Middle Class Families*. National Poverty Center Working Paper. http://www.npc.umich.edu/publications/working_papers/?publication_id=171&
- Kingsley, G.T., Smith, R., & Price, D. (2009). *The Impacts of Foreclosures on Families and Communities*. Report prepared for the Open Society Institute. Washington, DC: The Urban Institute.
- Lavy, V. and A. Schlosser. 2007. Mechanisms and Impacts of Gender Peer Effects at School. NBER Working Paper No. 13292. <http://www.nber.org/papers/w13292>
- Kling, J.R., J.B. Liebman, & L. Katz. (2007). [Experimental Analysis of Neighborhood Effects](#). *Econometrica* 75(1): 83-119.
- Moreno, A. (1995). *Cost Effectiveness of Mortgage Foreclosure Prevention*. Minneapolis, MN: Family Housing.
- Munnell, A.H., G. Tootell, L. Browne & J. McEneaney. (1996). Mortgage lending in Boston: Interpreting HMDA data. *American Economic Review* 86(1), 25-53.
- McMillen, D.P. (2003). [Neighborhood House Price Indexes in Chicago: A Fourier Repeat Sales Approach](#). *Journal of Economic Geography* 3(1): 57-73.
- Nelson, A. (2009). Credit Scores, Race, and Discrete-Choice Residential Sorting. Revise and re-submit, *Journal of Policy Analysis and Management*.

- Nelson, A. (In press). Inequalities in Access to Credit for Language Minorities. In J. Baugh (Ed.) *Linguistic Profiling: Social Science, Fair Housing, and the Law*.
- Osborne, C. S. McLanahan. (2007). "Partnership Instability and Child Well-Being." *Journal of Marriage & Family* 69:1065-1083.
- Pennington-Cross, A., A. Yezer & J. Nichols. (2000). *Credit Risk and Mortgage Lending: Who Uses Subprime and Why?* Washington, D.C.: Research Institute for Housing America.
- Pettit B. & S. McLanahan. (2003). Residential Mobility and Children's Social Capital: Evidence from an Experiment. *Social Science Quarterly* 84(3): 632-649.
- Pribesh, S. & D. B. Downey. (1999). Why Are Residential and School Moves Associated with Poor School Performance? *Demography* 36(4), 521-534.
- RealtyTrac. (2009). *2009 U.S. Foreclosure Market Report*. <http://www.realtytrac.com>
- Rohe, William and Leslie Stewart. (1996). Homeownership and Neighborhood Stability. *Housing Policy Debate* 7(1): 37-81.
- Rosenbaum, P.R., and D.B. Rubin. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika* 70(1): 41-55.
- Rosenthal, S. (2008). [Old homes, externalities, and poor neighborhoods. A model of urban decline and renewal](#). *Journal of Urban Economics* 63(3): 816-840.
- Ross, S.L., & Yinger, J. (2002). *The color of credit: Mortgage discrimination, research methodology, and fair-lending enforcement*. Cambridge, MA: MIT Press.
- Ross, S.L. & G. Tootell. (2004). Redlining, the Community Reinvestment Act, and Private Mortgage Insurance. *Journal of Urban Economics* 55: 278-297.
- Ross, S.L., M.A. Turner, E. Godfrey & R. Smith. (2008). Mortgage Lending in Chicago and Los Angeles: A Paired Testing Study of the Pre-Application Process. *Journal of Urban Economics* 63: 902-919.
- Roy, J., M. Maynard, & E. Weiss. (2008). *The Hidden Costs of the Housing Crisis*. The Partnership for America's Success. Washington, D.C.
http://www.partnershipforsuccess.org/docs/research_report_200807_housing.pdf
- Schafft, K.A. (2003). Low Income Student Transiency and Its Effects on Schools and School Districts in Upstate New York: The Perspective of School District Administrators: A Research Summary Report. ERIC Working Paper.
http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1b/56/79.pdf

- Schuetz, J., V. Been, & I.G. Ellen. (2008). [Neighborhood effects of concentrated mortgage foreclosures](http://ideas.repec.org/a/eee/jhouse/v17y2008i4p306-319.html). New York University Working Paper. <http://ideas.repec.org/a/eee/jhouse/v17y2008i4p306-319.html>
- Schwartz, A. E., Stiefel, L. & Chalico, L. (2007). The multiple dimensions of student mobility and implications for academic performance: Evidence from New York City elementary and middle school students. New York University Working Paper. <http://www.albany.edu/edfin/documents/schwartzstiefelmobilitypaper.pdf>
- Stein, K. & M. Libby. (2001). *Stolen Wealth: Inequities in California's Subprime Mortgage Market*. Durham, NC: Center for Responsible Lending.
- Stein, E. (2001). *Quantifying the Economic Cost of Predatory Lending*. Durham, NC: Center for Responsible Lending.
- Tootell, G. (1996). Redlining in Boston: Do Mortgage Lenders Discriminate against Neighborhoods? *Quarterly Journal of Economics* 111: 1049-1079.
- Weinberg, B. (2006). Social Interactions and Endogenous Association. Ohio State University Working Paper. <http://economics.sbs.ohio-state.edu/weinberg/socint1.pdf>

