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IMMIGRATION AND THE NEIGHBORHOOD

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Abstract

What impact does immigration have on neighborhood dynamics? *Within* metropolitan areas, we find that housing values have grown *relatively* more slowly in neighborhoods of immigrant settlement. We propose three nonexclusive explanations: changes in housing quality, reverse causality, or the hypothesis that natives find immigrant neighbors relatively less attractive (native flight). To instrument for the actual number of new immigrants, we deploy a geographic diffusion model that predicts the number of new immigrants in a neighborhood using lagged densities of the foreign-born in surrounding neighborhoods. Subject to the validity of our instruments, the evidence is consistent with a causal interpretation of an impact from growing immigration density to native flight and relatively slower housing price appreciation. Further evidence indicates that these results may be driven more by the demand for residential segregation based on race and education than by foreignness *per se*.

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1 Introduction

What impact does immigration have on neighborhood dynamics? Do natives prefer to live in all-native neighborhoods? As with the migration of African-Americans from the South to the North in the first half of the 20th century, contemporary residential dynamics and the preferences of previous settlers to live and mingle with the new migrants in the same neighborhoods will be key to determining the outcomes of recent waves of immigrants, such as segregation, social capital, labor market networks, proficiency in the native language, and educational achievement (Borjas, 1995).

The existing economics literature on the impact of immigration has focused on the labor market. Recent studies (Scheve and Slaughter, 2002; Mayda, 2004) use a labor market factor-proportions approach to predict native attitudes toward immigrants and immigration policies (Goldin, 1994) and find that native workers who are more likely to be in direct competition with immigrants in the labor market tend to have negative views on immigration.

However, a good deal of the variance in attitudes towards immigrants remains to be explained. Some authors (O'Rourke, 2004; Dustman and Preston, 2000; Mayda, 2004) suggest that a number of individuals exhibit negative attitudes toward immigration for factors other than the labor market.

After all, immigration is not so much defined by the consumption of foreign labor, which can also be achieved by international trade, international outsourcing, off-shoring, or telecommunications. Immigration is truly defined by the physical presence of immigrants in the host country. While some natives in cities that do not receive immigration flows may conceptually oppose foreign trade, international outsourcing, or immigration, natives who do live in immigrant areas may engage in further considerations: Are there native preferences toward living and socially interacting with people of similar culture, language, ethnic, or socioeconomic background?

If natives exhibit negative preferences toward interacting with immigrants, we may be able to capture this effect through residential choices and housing market dynamics. A vast literature has demonstrated the existence of capitalization of local public goods on housing values (Oates, 1969) and the applicability of the hedonic model (Rosen, 1974) to estimate the market valuation of neighborhood characteristics. Bayer, Ferreira, and McMillan (2003), for example, show that the demand for living close to neighbors with "better" perceived sociodemographic characteristics has a strong impact on local housing prices. Closer to our work, a number of papers have used housing price differentials between African and European American neighborhoods to measure the extent of "decentralized racism" (Cutler, Glaeser, and Vigdor, 1999).[1]

Previous papers (Saiz, 2003, 2007) have showed that immigration has a positive impact on rental and house price growth in the metropolitan areas that receive immigration. This is a quite simple consequence of a local upward sloping supply of housing and population growth in the metropolitan areas where immigrants concentrate. However, it is not clear a priori whether, *within a metropolitan area*, prices in the neighborhoods where immigrants settle should grow at a *relatively* faster rate. Even if immigrants have preferences toward

[1]The list is too numerous for a detailed itemization: examples of this literature include Laurenti (1960), Bailey (1966), King and Mieszkowski (1973), Berry (1975), Galster (1977), Yinger (1978), Follain and Malpezzi (1981), and Chambers (1992). The main thrust of this literature is to distinguish between discrimination against blacks in the housing markets (which implies higher housing prices in black areas) versus "decentralized racism" where white flight is the product of white preferences for racial segregation (which implies lower housing prices in black areas). A good discussion of these hypotheses (and of the alternative "port of entry" explanation for higher prices in minority areas) can be found in Cutler, Glaeser, and Vigdor (1999).

living with other foreign-born individuals, this should not necessarily imply a price growth differential as long as there are mobile marginal natives still living in immigrant areas. However, if natives have preferences for living with other natives, or if there are preferences for socioeconomic segregation (à la Benabou, 1996, Bayer, Ferreira, McMillan, 2003), then immigration may actually be associated with a *relative* negative impact on housing prices.

We do find evidence that, controlling for the evolution of prices at the metropolitan area level, increases in a neighborhood's immigrant share are associated with lower housing price appreciation. This empirical fact is consistent with the idea that natives are willing to pay a premium for living in predominantly native areas.

It is also consistent with reverse causality: immigrants may be attracted by areas that are becoming relatively less expensive. Therefore, we use a *geographic diffusion* model (akin to an epidemiological contagion model) to generate predictions about the pattern of new immigrant settlement. We use these predictions as instruments for the actual changes in immigrant density in a neighborhood. The instrumental variables (IV) approach eliminates the possibility that our estimates are the result of immigrants mechanically chasing locations that are becoming less expensive. However, it is still possible that the neighborhoods that are generally close to the previous areas of immigrant settlement have characteristics that are becoming relatively less valuable to natives. We deal with this issue by using the heterogeneity in the predictive power of the geographic diffusion model as our effective source of identifying variation. For instance, in metropolitan areas with bigger immigrant inflows the same level of proximity of a neighborhood to existing immigrant communities predicts a more substantial change in the share of the foreign born. Controlling for the average proximity to existing immigrant communities in the second stage of our 2SLS specifications, we effectively compare the evolution of prices in neighborhoods that are *all* equally close to areas of previous immigrant settlement, but for which our model predicts different subsequent immigrant inflows.

The evidence is consistent with a statistically significant causal impact of immigration on home values. For instance, in an area where the share of the foreign born changes from 0 to 30 percent, housing values can be expected to be about 6 percent lower. This valuation reflects the tastes of the marginal native, and likely represents a lower bound for the willingness to pay for segregation of the average native. We also find that the association between immigrant density and relative price declines at the neighborhood level is concentrated in areas where most residents were non-Hispanic white prior to immigration shocks. In areas dense with minorities, the association between immigration and slower price growth is much weaker or nonexistent. Similarly, in areas where housing values were relatively low initially, the association between immigration and slower price appreciation is more tenuous. Therefore, immigration might actually be associated with revitalization in poor neighborhoods or neighborhoods with high concentrations of minorities.

The results are important for understanding the social impact of immigration on destination cities and, unfortunately, seem to bode ill for the integration of immigrants. Indeed, recent research finds that immigrant segregation in the US has been on the rise during the last three decades (Cutler, Glaeser, and Vigdor, 2005). The new immigrant ghetto may be mostly due to the tendency of immigrants to spatially cluster, but the paper shows that some natives may also have preferences for avoiding immigrant areas. Why? Our final results shed some light on this issue. In our sample of immigrant-dense cities, the correlation (at the census tract level) between the foreign-born share and the share of adults with less than a high-school diploma is 0.49. The correlation between decennial *changes* in the share foreign born and decennial *changes* in the share of high-school dropouts is a notable 0.35. The association between changes in immigrant shares and the growth in the share of minorities at the census tract level is similarly strong. The fact that neighborhoods with growing relative concentrations of immigrants are becoming relatively less educated and less white (two outcomes that are endogenous to the immigration inflows), can explain a good deal of the association between immigration and housing prices, since areas with less educated populations are being increasingly perceived as relatively less attractive places to live (Glaeser and Saiz, 2004). Thus, immigrant neighborhoods may not be becoming relatively less attractive because they are populated by the foreign born *per se*, but probably because they are more likely to contain population with perceived low socioeconomic status.

The rest of the paper is organized as follows. In section 2 we propose a conceptual framework to understand the interaction between immigrants, natives, and residential choice. In section 3 we discuss the data, and in section 4 the core results. Section 5 develops our IV strategy based on a geographic diffusion model. In section 6 we present further results relating to where and why immigration matters for the evolution of housing values and rents. Section 7 concludes.

2 Economics of Immigration and the Neighborhood

We propose the simplest possible framework based on conventional racial segregation models (Bailey, 1959; Schelling, 1971; Yinger, 1975; Courant and Yinger, 1975; Kanemoto, 1980). The model illustrates well the main issues at play, and we make two modeling assumptions that are of interest: income heterogeneity in the native population and preferences for ethnic clustering among immigrants. We assume a city with an exogenously given native population of measure one. Among natives, income has a uniform distribution so that a measure N of inhabitants has income equal or below $\chi + N$, where χ is the minimum income (maybe a government transfer) and $N \in [0, 1]$. Immigrants tend to cluster in specific city neighborhoods. In the 1980s, 95 percent of the change in the number of immigrants (75 percent in the 1990s) was concentrated in a number of census tracts that corresponded to about 25% of the 1980 metropolitan US population. We therefore assume that there are four neighborhoods and that immigrants tend to concentrate in one of them (neighborhood 4). The immigrant neighborhood may possess ethnic-specific amenities, or immigrants may just coordinate to move there due to a, perhaps mild, preference to live with other immigrants. Nevertheless, if natives have preferences for living with other natives, the final equilibrium in the housing market will imply clustering of immigrants even if the foreign born are indifferent as to neighborhood ethnic composition. The utility function of native i is Cobb-Douglas in consumption (C_i) and the share of natives in the neighborhood where i resides (ϕ_i):

$$U_i = C_i^{\varphi} \cdot \phi_i^{(1-\varphi)} \tag{1}$$

Each person consumes an identical unit of housing. Housing supply is assumed to be produced with unit elasticity, and rents in neighborhood $k(R_k)$ have the simple functional form:

$$R_k = \beta \cdot Pop_k \tag{2}$$

Where Pop_k is the total population in neighborhood k. Consumption depends on income and rents so that $C_i = \chi + N - R_i$, where R_i is the rent in the location chosen by the individual. In this simple model all houses are of the same quality and house prices are directly proportional to rents, capitalizing their present discounted value at the discount rate d: $\Pr ice_k = \frac{R_k}{d}$

Without immigration, all equilibria in the residential market imply that the population is evenly spread throughout each of the neighborhoods. If population (and thus rents) were lower in one of the neighborhoods, everyone would like to move there. There are multiple all-native equilibria with different income mixes by neighborhood. With immigration, the equilibrium in the housing market implies that the poorest natives will live in the immigrant neighborhood, since richer individuals have a higher willingness to pay for segregation (proof available on request). The rest of the native population will be evenly distributed in the three other neighborhoods. In a "mixing" equilibrium there is a marginal native with income $\chi+\underline{N}$ who is indifferent about whether he lives in the immigrant neighborhood or the rest of the city:

$$(\chi + \underline{N} - \beta \cdot [F + \underline{N}])^{\varphi} \cdot \left(\frac{\underline{N}}{\underline{N} + F}\right)^{(1-\varphi)} = \left(\chi + \underline{N} - \beta \cdot \left[\frac{1 - \underline{N}}{3}\right]\right)^{\varphi} \qquad (3)$$

Where F is the number of foreign-born individuals. Since all immigrants cluster in neighborhood 4 we use $\phi = \left(\frac{\underline{N}}{\underline{N}+F}\right)$. Under some parameters and with major immigration inflows, there may not be an equilibrium with a marginal native (i.e., the model may tip toward total segregation). However, the income effect typically helps to achieve some mixing: as the immigrant population in the immigrant neighborhood increases, the number of natives decreases, but the marginal native is poorer, and thus has a lower ability to pay for segregation.[2]

Equation (3) implicitly defines the number of natives in neighborhood 4 ($\underline{N}$) as a function of the number of immigrants (for some values of the parameters and the immigration inflows). Taking the derivative of this equation with respect to F yields:

$$\frac{\partial \underline{N}}{\partial F} = \frac{-\beta \cdot \phi^{\frac{1-\varphi}{\varphi}} \cdot \underline{N} - \phi \cdot C_{NAT} \cdot \left(\frac{1-\varphi}{\varphi}\right)}{\left(1+\frac{\beta}{3}\right) \cdot \underline{N} - (1-\beta) \cdot \phi^{\frac{1-\varphi}{\varphi}} \cdot \underline{N} - (1-\phi) \cdot C_{NAT} \left(\frac{1-\varphi}{\varphi}\right)} \tag{4}$$

Where $C_{NAT} = \left(\chi + \underline{N} - \beta \cdot \left[\frac{1-\underline{N}}{3}\right]\right)$. This expression is generally negative for equilibria with some ethnic mixing. To see an example of that, assume that the initial level of immigration is zero (and thus $\phi = 1$) to obtain:

$$\left.\frac{\partial \underline{N}}{\partial F}\right|_{\phi=1} = \frac{-\beta \cdot \underline{N} - C_{NAT} \cdot \left(\frac{1-\varphi}{\varphi}\right)}{\frac{4}{3} \cdot \beta \cdot \underline{N}} < 0 \tag{5}$$

More generally $\left.\frac{\partial \underline{N}}{\partial F}\right|_{\varphi \leq 1} < 0$, i.e. there is "native flight" out of the immigrant neighborhood, if natives do not display preferences for diversity ($\varphi \leq 1$) and there are any natives left.[3]

How about relative rents/prices? If natives are indifferent about the ethnic composition of their neighborhoods ($\varphi = 1$), and without massive levels of immigration (this is with

[2] Since some low-income individuals do not have the financial resources to respond to their tastes for segregation by moving to all-native neighborhoods, they may actually display stronger preferences for immigration limits or voice stronger opposition to immigration through their political choices, or in opinion surveys and daily behavior.

[3] Although the model does not have a closed form solution, unreported simulations (available on request) were used to generalize these "native flight" results for a number of combinations in the main parameters of interest.

$F \leq \frac{1}{3}$) we have that:

$$\left.\frac{\partial \underline{N}}{\partial F}\right|_{\varphi=1} = -\frac{3}{4} \tag{6}$$

Since the population in each of the three native neighborhoods is $Pop_j = \left(\frac{1-\underline{N}}{3}\right)$, and population in the immigrant neighborhood is $Pop_4 = F + \underline{N}$ we then have that:

$$\left.\frac{\partial Pop_j}{\partial F}\right|_{\varphi=1} = \left.\frac{\partial Pop_4}{\partial F}\right|_{\varphi=1} = \frac{1}{4} \tag{7}$$

And therefore:

$$\left.\frac{\partial R_j}{\partial F}\right|_{\varphi=1} = \left.\frac{\partial R_4}{\partial F}\right|_{\varphi=1} = \frac{\beta}{4} \tag{8}$$

Hence, even if immigrants exhibit a preference for clustering together in one neighborhood, prices will increase in all neighborhoods equally as long as there are mobile marginal natives in the immigrant quarters, and natives are indifferent about the ethnic composition of the neighborhood. It is therefore important to stress that in the model, within a city, and with no preferences for segregation, we should not expect any special correlation between immigration and prices. In fact, through a ripple effect, immigration is pushing up housing values in all neighborhoods.

With $\varphi < 1$ (native preferences for homogeneity), in an interior equilibrium, housing price growth needs to be slower in the immigrant areas: $\left.\frac{\partial R_j}{\partial F}\right|_{\varphi=1} > \left.\frac{\partial R_4}{\partial F}\right|_{\varphi=1}$: immigration will be associated with native flight of relatively high-income individuals, but some low-income individuals will have an incentive to remain in the immigrant neighborhoods due to the compensating differential of lower housing prices.[4] This implies that, if one wanted to

[4]To see that, remember the equilibrium condition $(\chi + \underline{N} - R_j)^{\varphi} = (\chi + \underline{N} - R_4)^{\varphi} \cdot \phi^{1-\varphi}, \;\forall j \neq 4$. With

use changes in housing values as a money metric to measure tastes for ethnic homogeneity, the parameters obtained would correspond to the relatively low-income individuals who are in the relevant margin. Thus, with native preferences for segregation there is a negative relationship between the immigrant share and relative housing value growth.[5] To illustrate these effects, in Figure 1, we present the results of simulations of the model, where we assume the parameters to be $\beta = 1$, $\varphi = 0.9$, and $\chi = 0.5$. Rents (and hence prices) are growing in both the immigrant and non-immigrant neighborhoods. However, the rate of growth is faster in the native neighborhoods.

It is interesting to note that, once there are no natives remaining in the immigrant neighborhood,[6] further immigration inflows into the area involve growing prices in the immigrant ghetto and no price inflation in the rest of the city. Also note that if natives actually exhibit a preference for diversity ($\varphi > 1$), prices (and population) will go up in the immigrant neighborhood: in this case some natives would actually move into the immigrant neighborhood. Thus, *immigration may push up housing values in a neighborhood only if there are no marginal natives remaining, or when natives have preferences for diversity.*

In all cases, immigration will push average metropolitan housing prices up. Even with tastes for segregation, prices may increase in immigrant neighborhoods (this depends on the parameters of the model and on immigration levels), but just not as fast as in the rest of the metropolitan area.

($\phi < 1$) then $(\chi + \underline{N} - R_j)^{\varphi} < (\chi + \underline{N} - R_4)^{\varphi}$, which implies $R_j > R_4$.

[5] With a very high distaste for diversity among natives, price growth in immigrant areas might even be negative in absolute terms despite the fact that the average city rent growth is positive.

[6] Absolute segregation may be very difficult, since there are natives who are not mobile, who are not marginal (for instance they value that location very highly), or native children of immigrants.

3 Data and its Methodological Implications

We use decennial data for the metropolitan areas of the United States at the census tract level. A census tract is a small census-defined geographic level which, on average, encompasses a population of about 4,000 inhabitants in the 1990 and 2000 censuses. The version of the data that we use is provided by Geolytics Inc. Census tract geographic definitions change decennially. However, our data are processed so that we keep the geographic tract definitions constant over the years 1980, 1990, and 2000. Census tract and metropolitan statistical area (MSA) boundaries correspond to their 1999 definitions. Census tracts can be interpreted as a geographical measure of neighborhoods and have been used in this sense by previous researchers.

Several variables concerning the socioeconomic characteristics of the neighborhood are available and will be used: housing stock characteristics (age, number of detached housing units, number of rooms, presence of kitchen facilities, plumbing, and others), income, population, employment, education, age structure, ethnic composition, number of foreign-born individuals, distributions of marital and family status, data on housing prices, ownership rates, vacancy rates, latitude and longitude, state, metropolitan area, county, minor civil division, and school district identifiers. We are also able match the census tract data to geographic data from the United States Geological Survey (USGS) on land use by tract in 1992. Distance to central business district (CBD) is calculated by the authors using the coordinates of the census tracts defined as CBD by the 1982 Census of Retail Trade.

Due to data availability constraints we will focus on the last two decades (1980, 1990, and 2000). In areas with scant international migration inflows, the location of immigrants and their impact may be very idiosyncratic. We therefore focus on metropolitan areas and years for which the decennial change in the number of the foreign born amounted to 5 percent or more of the MSA population in the previous census.[7] In the 2000 census, for example, this included some 67 metropolitan areas, which received 76.5 percent of all metropolitan immigration inflows (whereas the other 264 metro areas only accounted for 23.5 percent of new immigrants). Overall we have 34,835 tract observations in 122 MSA-year groups.

Several limitations of the data are worth mentioning. We would have liked to have more elaboration on the characteristics of immigrants, rather than a general variable on the number of the foreign born. The census micro-data (IPUMS) can, and will, be used to cross-tabulate foreign-born status with other characteristics (education, income, ethnicity, English proficiency), but unfortunately the data do not allow for the identification of the exact neighborhood where the individuals live. Thus, the paper identifies the average treatment effect of immigration (ATE) on the neighborhoods where immigrants locate. For 1990 and 2000, however, we have been able to create immigration counts by nationality using published census tract cross-walks and we will infer local immigrant characteristics using that information. Also, we cannot identify in the data those young members of immigrant families who were born in the United States. Despite the limitations, the wealth of data proved to be extremely useful in identifying the average impact of the foreign born on the dynamics of neighborhoods in immigrant cities.

[7] The results are not sensitive to that threshold. We have performed regressions in which we censor the sample to MSAs and decades with immigration amounting to more than 2.5% of the initial population and the main qualitative results do not change. It is not clear whether small concentrations of immigrants in areas where immigration is not important constitute treatments of interest if one wants to learn about the impact of the foreign born within areas that do experience major immigration inflows. Moreover, our geographic gravity pull model is not applicable in areas that have received relatively small immigration inflows.

4 Core Results

Following the discussion in section 2, we are interested in knowing whether changes in the immigrant share are related to changes in housing prices. To do so, we follow the evolution of average housing values in the census tracts of high-immigration metropolitan areas in the 1980s and 1990s. In Table 1, we start by regressing the inter-census (10-year) change in the log of the average house value in a neighborhood on the change in the share of the foreign born. Using changes in housing prices and the share of the foreign born in a neighborhood helps us control for time-invariant omitted variables related to neighborhood quality, the relative valuation of which stays constant across decades. The model that we estimate takes the form:

$$\Delta \ln P_{i,M,T} = \alpha_{M,T} + \lambda \cdot \Delta \left(1 - \phi_{i,M,T}\right) + \Delta Z_{i,M,T} \cdot A + X_{i,M,T-10} \cdot B + \xi_{i,M,T} \qquad (9)$$

Subscripts i, M, and T are for neighborhood (census tract), MSA, and year, respectively. $P_{i,M,T}$ is the average house price in the neighborhood, $\alpha_{M,T}$ are a group of MSA-by-year fixed effects (we concentrate on the *impact of immigration within a metropolitan area and year)*, Z is a vector of housing stock traits, and X is a vector of initial socioeconomic characteristics of the neighborhood. The regressions are weighted using the initial number of owner-occupied housing units in the neighborhood as weights.[8] Using the notation from the model, the main variable of interest $\Delta \left(1 - \phi_{i,M,T}\right)$ is the change in the share of the foreign born.

Column 1 in Table 1 only controls for MSA-year fixed effects. A change of one percentage

[8] We use the initial number of renter households as weights in the regressions where the dependent variable is the average rent in the tract.

point in the share of immigrants in a neighborhood is associated with a relative decrease of roughly 0.42 log points in the neighborhood's average housing price. In column 2 we control for contemporaneous changes in the observable characteristics of the housing stock. The variables that we use are specified in Appendix Table 1. Obviously, housing prices will be a function of the physical attributes of the housing units in a neighborhood. While changes in observable housing characteristics may be endogenous to immigration, we want to focus on the impact of immigration on quality-adjusted housing values. We also control for the initial housing characteristics and other lagged socioeconomic neighborhood variables in levels.[9] We do not believe in a model where lagged variables in levels have an infinitely durable impact on growth rates, but the valuation of place-specific characteristics has been changing in the last part of the 20th century, and some of these initial variables are good predictors of subsequent housing price growth (Glaeser, Kolko, and Saiz, 2002; Glaeser and Saiz, 2004). The initial values of the socioeconomic variables should therefore capture evolving trends in the valuation of preexisting neighborhood traits and partially capture the impact of social trends that are unrelated to subsequent immigration levels. The coefficient of the change in the foreign born share is reduced by about 40 percent using these controls. The main drivers of the difference between columns 1 and 2 are the changes in the observable quality of housing. Nevertheless, most of the association remains after controls are introduced. In column 3, we add two indicators of the environmental quality of the neighborhood: the shares of area in the tract covered by water and devoted to industrial or commercial uses in

[9] We obviously do not control for *changes* in socio-economic characteristics of the neighborhood, since these are endogenous to immigration. In other words, immigration clearly has an impact on housing values because the attributes of the individuals who move into the neighborhoods (the new immigrants) are different. We will think of this impact as the relevant treatment effect of immigration. Later, we will discuss through which channels the treatment effect of immigration on local prices may work.

1992.[10] Results do not change much.

It is well known that housing values tend to mean-regress (Case and Shiller, 1995; Rosenthal, 2004). Likewise, we know that immigrants tend to locate in areas with initially low housing values. We therefore include in column 4 the initial log of housing values to allow for mean-reversion. More generally, this variable may capture the general evolution of prices in neighborhoods of different initial housing quality (which might, for instance, be affected by widening income inequality). While we find evidence of strong mean-reversion over the period we examine, this fact does not substantially affect our main estimate.

Are the results just driven by differential trends in the neighborhoods where immigrants settle? For instance, immigrants may find more attractive, affordable, or available those areas in which housing prices have been trending down. To mitigate these concerns, column 5 includes on the right-hand side home value growth in the previous decade (and column 6 also controls for the change in the log of income in the previous decade). The results of the main variable of interest do not change much after the inclusion of these trends.

Is the impact of changes in the share foreign born nonlinear? Classical tipping models (*à la* Schelling, 1978) suggest bigger impacts when minority concentrations are bigger. Conversely, if relatively minor immigration inflows forecast bigger inflows in the future, most of their impact may be concentrated in the initial stages of the process of immigrant settlement. In our data, higher-order polynomials on the change in foreign-born density are never economically significant. This can be appreciated graphically in Figure 2, a scatter plot where the change in the share of the foreign born appears on the horizontal axis and the change in

[10] The latter variable is somewhat endogenous to the evolution of land values in a tract that is residential use (lower land values in a residential use foster shifting to alternative uses), so we may underestimate the impact of immigration but may also capture pre-existing patterns of industrial location.

the log of housing values on the vertical axis. Both variables are partialed out of the other controls in Table 1, and the line displays the prediction from an OLS regression. While the results are consistent with the approximately linear pattern of changes in prices that we obtained through the model simulations (Figure 1), the existence of tipping equilibria in immigrant neighborhoods is an issue that warrants more research.

In Table 2, we extend our findings in several directions. Many of the neighborhoods where new immigrants settle were already quite distinctively immigrant-dense. Established foreign-born residents may be better at choosing those neighborhoods that will become more affordable in the future and new immigrants may just be following. To focus on the changes in prices in new immigrant neighborhoods, we restrict our sample to those tracts with initial immigrant densities below the MSA median (Table 2, column 1). The negative association between immigrants and prices does not seem to be associated with general trends in the older "port of entry" neighborhoods.

The regression in Table 2, column 2 uses the log of median house value rather than the average house price. We only have median home values by census tract for 1990 and 2000, so we restrict our attention to the 1990s. Our baseline estimates are not driven by the upper or lower tails of the housing value distribution, since the results using median values are remarkably close to the previous ones.

In column 3 we address potential issues concerning heterogeneity in housing supply elasticities or potential idiosyncrasies in the geographic location of immigrant communities.[11] In

[11] If the law of one price holds at the MSA level, housing prices should reflect the valuation of the neighborhood's attributes by the marginal mover regardless of the elasticities of housing supply (to see this, assume heterogeneous housing supply elasticities in the model in section 2). However, if the local housing market is in disequilibrium neighborhood housing supplies might matter to explain the differential evolution of prices in different neighborhoods in the short run.

Table 1 we controlled for past density (in unreported regressions, controlling for central city location did not change the results). We go further now and divide the sample of neighborhoods into quartiles defined by density and distance to the central business district at T-10 *within each MSA*. We then run separate regressions as in table 1, column 2, within each of the 16 possible density-distance quartile combinations. Finally, we average the individual results using the number of tracts in each of the 16 resulting groups as weights. The results are notably similar to the ones in previous specifications. The negative relative association between immigration and prices is found within each of these 16 very different types of communities: from dense areas close to the city center, to low-density suburban locations far away from the metro core.

In the last column of Table 2, we include lagged immigrant density. Again, we want to control for general trends in amenities and housing values in the areas where immigrants tended to settle in the past. Controlling for this variable does not change the coefficient of interest. In unreported specifications we also conducted separate regressions for each of the available decades (1980s, and 1990s). The relative association of the change in the foreign born and housing price inflation was negative in both decades.

The results do show a clear negative contemporaneous correlation between changes in housing prices and growth in immigrant density. As we will examine in more depth below, this may mean that immigrants are attracted to areas in which prices grow less slowly (as opposed to areas with low price levels), or that there are omitted variables that are correlated with both international migration and house values. However, part of the negative association may be causal. There may be tastes for socioeconomic homogeneity among natives that account for the results.

An alternative causal interpretation of the results implies a housing *filtering* story, where the housing quality desired by immigrants is lower than the quality of the existing housing stock. In this story, immigrants (or their landlords) do not make substantial investments in their housing units and the price of these units goes down, without any negative capitalization effects on land values. Given the magnitude of our estimates, this story would imply a physical depreciation of immigrant-occupied homes substantially greater than 25 percent each decade.[12] The fact that median home values change also in neighborhoods where the median owner is a native makes this hypothesis less likely. Nevertheless, despite the fact that we do include controls for changes in quality in our regressions, some quality attributes may remain unobservable to us.

To address this issue, we use data from the American Housing Survey. The 2001, 2003, and 2005 issues of the survey include information about the foreign-born status of the different household members in the sample. The data also contain detailed information on housing quality and investments in renovation, maintenance, alterations, and repairs at the household level. We run regressions where housing investment (OLS regression) and up to 17 quality indicators (logit specifications) are on the left-hand side and an indicator that takes a value of one if any of the household members is foreign born is the main explanatory variable[13] For each quality/investment attribute, we run regressions that only control for year fixed effects (left columns) or for a more complete set of household attributes: income, marital status, gender, and age of reference person, year fixed effects, and a dummy for

[12] Land values are typically high in these areas, so the structure accounts for a relatively smaller fraction of the house value. If the impact of immigration on the total price has to come from changes in the value of the structure, this implies a much higher depreciation rate on the physical structure.

[13] We obtained similar results using the foreign-born status of the reference person instead.

recent movers (right columns). We present regressions that use the cross-sectional variation in the pooled data from 2001, 2003, and 2005 (upper rows), and regressions that include housing unit fixed effects for those observations appearing both in the 2001 and 2005 samples (bottom rows). Since we use two time observations, this fixed effects model is identified from changes in the immigrant status of the homeowner.[14]

The results in Table 3 are notably consistent. The cross-sectional evidence shows that immigrant homes are not of lower quality, and some of their attributes may even be better (significant coefficients at the 5% level are highlighted). In no case is a *change* toward immigrant ownership of a housing unit associated with negative changes in observable quality.

Quality is a stock variable and may evolve very slowly. But the total expenditure on maintenance and renovation is a flow variable that is under direct control of the household. The evidence does not support the view that immigrant homeowners may depreciate faster their housing assets faster by investing less in maintenance and renovation either.

5 A Gravity Model of Immigrant Residential Choice

It is not too complicated to think of two reasons why immigration inflows may be endogenous to the contemporaneous evolution of housing prices. One is reverse causation. Immigrants may be looking for affordable housing and avoid those areas where home values are growing faster than the MSA's average. In this case, the association between immigrant inflows and relative price inflation is negative, but for causes other than international migration itself.

[14] Changes in quality and immigrant status of the homeowner between two consecutive sample years are too noisy to be reliably used, and therefore we do not include the 2003 observations, relying rather on the "long-differences" in the variables.

The second reason why changes in the share of the foreign born may not be exogenous to the error term is omitted variables. Moving costs are sunk for newly arriving immigrants. They are, initially, very mobile. Immigrants may tend to select the best new locations in the city: those locations that are experiencing improvements in public goods or amenities, or nicer, high-quality new housing developments. Or, they might be attracted to neighborhoods with improving job prospects. That would lead to an overestimate of the association between the growth in the foreign-born population and price inflation. Alternatively, omitted variables, such as the changing valuation of neighborhood characteristics that are correlated with immigration, could bias the relevant coefficient downward.

To deal with reverse causation and omitted variables, we would optimally like to observe exogenous immigration shocks into a group of neighborhoods and analyze the subsequent evolution of housing values. We devise an instrumental variable strategy that tries to emulate that ideal experiment. Immigrants tend to cluster in proximity to where other immigrants live, which is a very well-documented fact both in sociology and economics (Borjas, 1992, 1995; Moebius, 2002). There are many reasons for immigrant clustering, most of them having to do with the advantages of proximity to people in the same national, ethnic, linguistic, or socioeconomic group (such as sharing information and the use of common local public goods). We take advantage of this immigrant clustering to partially predict the patterns of new immigrant settlement in US metropolitan areas. Again, we limit ourselves to metropolitan areas with major immigration inflows.[15] In our model, all-native neighborhoods that are geographically close to existing immigrant enclaves have a higher probability of becoming

[15] If there are no new immigration inflows, reversion to the mean is expected: immigrant clustering would be decreasing every year and predicting the change in the immigrant share by neighborhood would be a dubious exercise.

immigrant areas in the future. We start by defining a variable that proxies for the appeal of a neighborhood to immigrants using the following gravity equation:

$$Pull_{i,T} = \sum_{\substack{j \neq i \\ j \in M}} \frac{\left(1 - \phi_{j,T-10}\right) \cdot Area_j}{\left(d_{ij}\right)^{\beta}} \tag{10}$$

$Pull_{i,T}$ is our estimate of the immigrant "geographic gravity pull" of a neighborhood i (which is located in a metropolitan area M) at time T. $\left(1 - \phi_{j,T-10}\right)$ is the share of immigrants in neighborhood j in the previous census (ten years ago), $Area_j$ is the area (square miles) of the corresponding jth census tract, and d_{ij} is the distance between neighborhoods i and j. Our measure of "gravity" is a weighted average of lagged immigrant densities in neighboring communities, where the weights are directly proportional to the area of neighboring tracts and inversely proportional to their distance from the relevant neighborhood.

The intuition for this geographic diffusion approach can be easily grasped by looking at Figure 3. The grids in the figure represent census tracts in a metropolitan area. Immigrant density is signified by a darker color. At time T-10, census tract A is surrounded by immigrant-dense neighborhoods. Tract B is further from the areas of immigrant settlement, and C is further yet. At time T (after 10 years), and assuming that the city is receiving further immigrant inflows and that immigrants keep clustering, we would expect tract A to receive a higher immigrant intake.

An important parameter in our gravity model is the coefficient of spatial decay, β. We do not have strong priors on the exact magnitude of this parameter and so we let the data convey that information. In general, however, we expect β not to be too close to zero, since we believe that distance from established immigrant communities does deter somewhat immigrant inflows. Conversely, β cannot be too big, since we expect immigrants to value general access to a portfolio of neighboring communities and not to focus exclusively on one point in space. In practical terms, we measure the distance between two census tracts as the Euclidean distance in a longitude-latitude degree two-dimensional plane. In order to choose the parameter β, we simulate different patterns of lagged spatial correlation in the distribution of immigrants in the 2000 census. For each potential β, we fit the model:

$$(1 - \phi_{i,2000,M}) = A_M + \gamma \cdot Pull_{i,2000,M} + \varepsilon_{i,2000,M} \tag{11}$$

M is a subscript for metropolitan areas and A is a metro area fixed effect. We are searching for the parameter β that maximizes R-squared in equation (12). The results from this exercise can be appreciated in Figure 4. There is a clearly concave relationship between β and the fit of our lagged spatial correlation model. The maximum predictive power of the model is obtained for a spatial decay parameter close to 1.6, which is the number that we settle for.[16]

How well can we predict changes in immigration density using our geographic gravity pull variable? The answer is that $Pull_{i,T}$ is an excellent instrument, but there is a lot of variation left to explain outside of the gravity model. This can be seen graphically in Figure 5. The figure shows a scatter plot with the calculated $Pull_{i,T}$ (partialed out of MSA-year fixed effects) on the horizontal axis and the change in the share of the foreign born in each tract (similarly partialed out of MSA and year influences) on the vertical axis. The line of

[16] The results in the paper would not change much if we set beta to be equal to 2, the classical Newtonian gravity parameter.

best fit (OLS prediction) has a significantly positive slope. However, much variation in the changes in immigrant density remains to be explained.

In Table 4, we present the results of a regression where we use $Pull_{i,T}$ directly as an instrument for the change in the immigrant share in a neighborhood. Appendix Table 2 shows the first stages of all 2SLS regressions. Neighborhoods that were located close to previous centers of foreign born settlement attracted new immigrants subsequently. The F-test for the excluded exogenous variable is 76.01. The results in Table 4, column 1, still point to a strongly negative impact of immigration on the relative evolution of prices within a city. Columns 2 and 3 add the share of immigrants in the neighborhood at T-10 and other control variables to obtain similar, albeit more imprecise, estimates. Note the loss in the power of the instrument in the first stage in column 3 due to the strong correlation between $Pull_{i,T}$ and past immigrant density. We can think of the IV strategy now as the capturing the variation in $Pull_{i,T}$ that is orthogonal to past immigrant density.

A potential caveat of the instrument hinges on the exogeneity assumption of $Pull_{i,T}$ with respect to the subsequent evolution of prices. It is certainly possible that previous immigrants were attracted to neighborhoods with characteristics that are becoming relatively less valuable to natives, and which are also spatially correlated. An additional, very related, concern hinges on the possibility that proximity to immigrant neighborhoods may be associated with increasing negative externalities that spill over.

We deal with these issues by using the heterogeneity in the predictive power of the geographic diffusion model as our effective source of identifying variation. $Pull_{i,T}$ may be a worse predictor of future growing immigration in neighborhoods that are already heavily immigrant. For example, if 100 percent of the population in a tract is already composed of immigrants, proximity to other foreign-born areas will not be predictive of increases in its immigrant density. We model the fact that geographic diffusion of immigration is more likely to go from more immigrant-dense neighborhood to less immigrant-dense neighborhoods by interacting $Pull_{i,T}$ with the lagged share of the foreign born. The intuition behind this strategy can be seen in Figure 6. Tracts A and B are exposed to a similar geographic immigrant pull in period T-10. However, we might expect immigration density to grow faster in tract B, since tract A is already more immigrant dense, and B is further from its steady-state equilibrium.

We use the general MSA level of immigration similarly. If there is no new immigration into the city, we would not expect the "gravity pull" of a neighborhood to be a particularly good predictor of future changes in the immigrant share. Therefore, the interaction between $Pull_{i,T}$ and the relative magnitude of immigration by metropolitan area is likely to improve the predictive power of the geographic diffusion model.[17] This research design can be grasped from Figure 7. At time T-10, tract A1 (in city 1) and tract A2 (in city 2) are identical in terms of proximity to immigrant neighborhoods. But since new immigration is greater in city 1, we can expect our geographic diffusion model to predict more immigration in A1 than in A2.

Using the interactions of $Pull_{i,T}$ with the initial share of the foreign born and immigration per capita in the MSA, we can control for the "gravity pull" of a neighborhood on the right-hand side in the second stage of our 2SLS specification. The identification now comes from comparing two census tracts with the exact same estimated "gravity pull" but with different

[17] We divide the number of new immigrants in an MSA by its initial population to obtain the relative size of immigration.

initial immigrant densities or with different immigration shocks at the MSA level. While neighborhood dynamics, unobserved characteristics, and externalities should be similar in these neighborhoods, the expected growth rate of their foreign-born share is different.

In column 5, we still find a significantly negative, albeit smaller, impact of immigration in otherwise similar communities, and the precision of our estimates increases (F-tests suggest very strong instruments, Hansen overidentification tests fail to reject exogeneity). The latter results suggest that reverse causation or neighborhood characteristics could account for up to 15 percent of the negative impact of immigration on changes in values in the regressions with controls, and up to 50 percent of the raw correlation. The rest seems to be causal.[18] In order to obtain a sense for orders of magnitude, assume that a neighborhood goes from having no immigrants to having a foreign-born density equivalent to 30 percent of the population. The results in Table 5, columns 4 and 5, suggest that housing prices will grow about 6 percent more slowly in these areas over a period of ten years.[19]

6 Further Results

6.1 Native mobility and white flight

It is interesting to map changes in immigrant concentration to changes in native population. Trivially, the growth in the share of the foreign born implies a commensurate negative change

[18] Another potential concern is that the $Pull_{i,T}$ variable may be correlated with *changes* in the immigrant density of neighboring communities and that there are spillovers across neighborhoods. Controlling for $(Pull_{i,T+10} - Pull_{i,T})$ on the right-hand side does not change the results (note that $Pull_{i,T+10}$ is actually a contemporaneous measure of spatial distance to immigrants).

[19] In Appendix Table 3 we reproduce some of the results in Table 4, but this time, using $\Delta Pull_{i,T}$ or nonlinearities in the initial immigrant density as instruments for the change in the foreign-born density. The results are not too dissimilar from the ones in the OLS regressions.

in the share of natives. In order to learn about this issue, therefore, we consider the change in the number of immigrants, natives, and non-Hispanic whites, divided by the original tract population as the relevant measures of local demographic change.

In Table 5, columns 1 and 3, not surprisingly, we find that in areas with more immigrants, the native and white populations also grew. This is not surprising because immigration is endogenous: we can expect growing areas to attract a growing share of the city's population (native and immigrant alike). In fact, depending on the initial shares of the foreign born, it is possible that some of these areas are becoming relatively less immigrant dense.

A more interesting exercise is to use our most demanding IV strategy (as in Table 4, column 5) to asses the impact of *exogenous* immigration shocks. Remarkably, these are associated with absolute decreases in the level of native population. Such "native flight" can be entirely accounted for by a shrinking non-Hispanic white population in these areas.[20] The difference between columns (4) and (2) is quite consistent with the fact that the average immigrant family has about 0.45 native children per immigrant, and with the fact that in the areas where the instrument has most of its *"bite"* (neighborhoods with high immigrant concentrations) immigrants tend to be minorities (mostly Hispanic and Asian).

6.2 Heterogeneous treatment effects

In Table 6, we speculate about the possibility that the treatment effect of immigration is different in different types of neighborhoods. Concretely, we interact the change in immigrant density with the initial values of two variables: the share of non-Hispanic white population

[20] Note that, unfortunately, we do not have cross-tabulations of immigrant and non-Hispanic White status at the census tract level.

and the within-MSA quartile of housing values at T-10 (the relevant variable takes value zero for the first quartile, and 1, 2, and 3 for the subsequent quartiles). The regressions (columns 1 to 3) control for all the other relevant variables in our baseline specification.[21] The results show that the association between growing immigrant density and slower housing price appreciation is much more relevant in those neighborhoods where the population was predominantly white in the initial period. Similarly, the impact of immigration seems to be stronger in neighborhoods that were initially more expensive. These results are suggestive of heterogeneous treatment effects, and are consistent with the existence of residential preferences based on race and income.

6.3 Rents

In Table 7 we show how the negative association between immigration and housing prices also holds for rents. We limit our sample to those metropolitan areas without rent control regulations. The general associations with rents (columns 1 and 2) are weaker. However, their magnitude can be explained by the fact that rental units tend to be in areas denser with minority households and with low housing quality. The interacted models posited in the previous section, this time using data on rents (columns 3, 4, and 5), yield estimates that are surprisingly close to those in Table 6.

[21] We do, however, substitute the log of lagged income by the log of lagged housing values when using the interaction between immigration and housing value quartiles. The correlation between the log of incomes and the log of values is 0.9, so the two variables play a similar role as controls, and cannot be used together due to multicollinearity problems.

6.4 "Unbundling" immigration

In Tables 1, 2, and 3 we have determined that no more than 0.18 log points of the initial association (0.42) between changes in immigrant density and price depreciation can be explained by changes in the quality of the housing stock and predictable neighborhood trends. Our IV strategies do not provide an exact point estimate. Notwithstanding this fact, we can conservatively use the estimates in Table 4 (columns 4 and 5) to conclude that up to an extra 0.03 log points may be accounted by omitted variables and reverse causation. But then, what does account for the remaining causal impact (49 percent of the initial raw association)?

In Figure 8, we carefully lay out the likely avenues through which immigration may be associated with changes in local neighborhood housing values. We think the figure to be extremely illustrative of the issues surrounding our empirical approach, hence we recommend that the reader study it carefully.

First, as in our model, natives may have preferences for living with other natives. Second and third, natives may have preferences for living with individuals of the same racial or ethnic group, or with individuals of higher socioeconomic status. This latter preference is consistent with models based on local human capital externalities (Benabou, 1993) and with empirical evidence of segregation by income in the United States (Davidoff, 2004). In fact, income segregation was higher in 2000 than in 1970 in the US metropolitan areas (Watson, 2003). Under these two scenarios, the model discussed earlier in the paper is still applicable, but now, rather than foreignness *per se*, the salient characteristics that determines residential segregation are race or socioeconomic status. Finally, another possibility is that the quality of schools worsens in the areas where immigrants concentrate or that parents perceive this to be the case. For instance, if schools have to divert more resources toward English as a second language programs, that may detract from the resources devoted to other educational programs.

In Table 8 we provide evidence against the first hypothesis based on simple nativist preferences. If natives simply want to avoid living with foreigners, the association between immigration and prices should be similar for all immigrant groups in the US. Using the 1990-2000 census tract cross-walk we are able to produce estimates of immigrants by national group by tract (as defined in the 2000 census) for 1990 and 2000.[22] We then merge data on the nationalities with a relatively small number of migrants into broader regional groups. Column 1 shows regressions where we control for the changes in the different immigrant shares by nationality. The association between changes in the share of Europeans, South Asians (from the Indian subcontinent), and Cubans and changes in housing prices is not statistically or economically different from zero. There is a fair amount of heterogeneity by national origin. These results do not seem consistent with a model of generalized, untargeted nativism.

Can broad trends in school quality or finances (as in Fernandez and Rogerson, 1996) explain our results? If the quality of education was very important to explain our results, we would expect the association of immigrant density with prices to be stronger *between* school districts rather than *within* school districts. In column 2, we show the results of a regression

[22] We assign 1990 immigrants to 2000 tracts using the share of the population in 1990 that was contained within the 2000 tract boundary. This, inevitably, generates measurement error because immigrants needn't be distributed within the tract as the rest of the population. Since we also have the actual number of total immigrants in each 2000-defined tract in 1990, we use only observations where our imputation of the *number* of immigrants in 1990 is within 10% of the actual number (83% of the cases). The correlation between our *imputed change* in the total share of the foreign-born between 1990 and 2000 and its *actual change* is 0.99 in this subsample.

that includes school district-by-year fixed effects, which are similar to the earlier estimates. However, the existence of private school alternatives and the fact that we do not have school attendance boundaries do not allows us to completely rule out a school-based explanation. More research on this issue is granted.

In column 3, we explore the other avenues through which we hypothesize immigration to impact neighborhood dynamics: ethnicity and socioeconomic status (SES). We do know that immigrant neighborhoods contain a higher share of less-educated and minority individuals. For instance, a simple regression with the share of high-school dropouts on the left-hand side and the share of the foreign born on the right-hand side yields an estimated elasticity of 0.65 (the t-statistic is 126). Unfortunately, the available data do not tabulate immigrant status with any of the SES of interest, and does not allow us to separate the impact of different types of immigrants directly.[23] But we can make use of the data on immigration by nationality to infer the immigration-driven "shock" to local SES characteristics. Using 1990 and 2000 microdata from the census (IPUMS) we calculate the average share of high-school dropouts and racial characteristics by immigrant national group and state of residence. We focus on these variables because other interesting immigrant SES attributes (income, or the ability to speak English well, for example) where found to be *extremely* collinear to, and therefore well explained by, these two main "factors" across national groups. We then proxy the immigrant-driven shock to these characteristics at the tract level using the shares by nationality. This is summarized in the equation: $S(X)_{iR} = \sum_{\forall C} \Delta f_{iC} \cdot X_{CR}$; the supply shock

[23] We cannot, alternatively, include the contemporaneous change in the share of uneducated individuals, or change in the minority share in the neighborhood as controls besides the change in the immigration share. These variables are clearly affected by the treatment. Immigrants embody traits such as education and ethnicity. Major immigrant inflows change the average characteristics of a neighborhood directly, and also indirectly, as such inflows are associated with *additional sorting of households between neighborhoods.*

S to attribute X, in census tract i, located in State R, is proxied by the sum of the changes in the shares of the foreign born f by country group C in the tract, multiplied by the average attributes by country-group and state. In Appendix Table 4 we summarize some of the relevant characteristics by country.

Introducing variables that capture the immigrant-driven supply shock to the local share of individuals who are high-school dropouts, and four racial/ethnic group shares (non-Hispanic White, Black, Asian, Hispanic), we find evidence that both education and race seem to matter (we also control for school district fixed-effects, in order to "unbundle" the three channels outlined in Figure 8). The negative association between immigration and changes in prices is stronger in neighborhoods where new immigrants are less educated and tend to be minorities. The coefficient on the Hispanic immigrant-driven shock is not significant, but this and the education variables are highly multicollinear (correlation of 0.91), and we cannot reject an impact statistically equivalent to that of the Asian variable. Although tentative, the results here suggest that the local interplay between immigrants and the cultural, racial, and SES preferences of natives should become a central topic for the economics research on the local impact of international migration.

7 Conclusions

Are immigrant neighborhoods attractive to natives? While previous research (Saiz, 2003, 2007) shows that metropolitan areas with major immigration inflows have tended to experience faster housing price inflation on average, we do not know much about the impact of immigration on local housing markets. In a theoretical model with perfect mobility, immigration need not have a positive impact on the relative housing prices of the neighborhoods where immigrants concentrate. However, if immigrant enclaves are perceived as less desirable places to live by natives, then we should expect a relative negative association between immigration density and housing prices.

Empirically, we find that, controlling for MSA-by-year fixed-effects, housing values grow relatively more slowly in neighborhoods with increasing immigrant density. This empirical fact is, indeed, consistent with the idea that natives are willing to pay a premium for living in predominantly native areas. It is also consistent with reverse causality: immigrants may be attracted to areas that are becoming relatively less expensive. Therefore, we used a geographic diffusion model (akin to an epidemiological contagion model) to generate predictions about the pattern of new immigrant settlement. We used these predictions as instruments for the actual changes in immigrant density in a neighborhood. Subject to the validity of our instruments, the evidence is consistent with a causal interpretation from growing immigrant density to "native flight" and relatively slower housing price appreciation. The causal impact is estimated to be 50 percent smaller than the raw association between changes in prices and immigrant density. Further results indicate that the negative association between immigration and local price growth may be driven more by the fact that immigrants tend to be of low socioeconomic status and to belong to minority groups, than by "foreignness" *per se*.

As with the African-American South-North migration of the first half of the 20th century, contemporary residential dynamics and the preferences of previous settlers to live with the new migrants in the same neighborhoods will be key to determining the future socioeconomic outcomes of the recent waves of immigrants. Given the growing demographic importance of immigration in the US, the results of the paper suggest that the disappearance of the new immigrant ghetto will be painfully slow.

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Figure 1

Immigrant Density and Housing Prices in a Simple Model

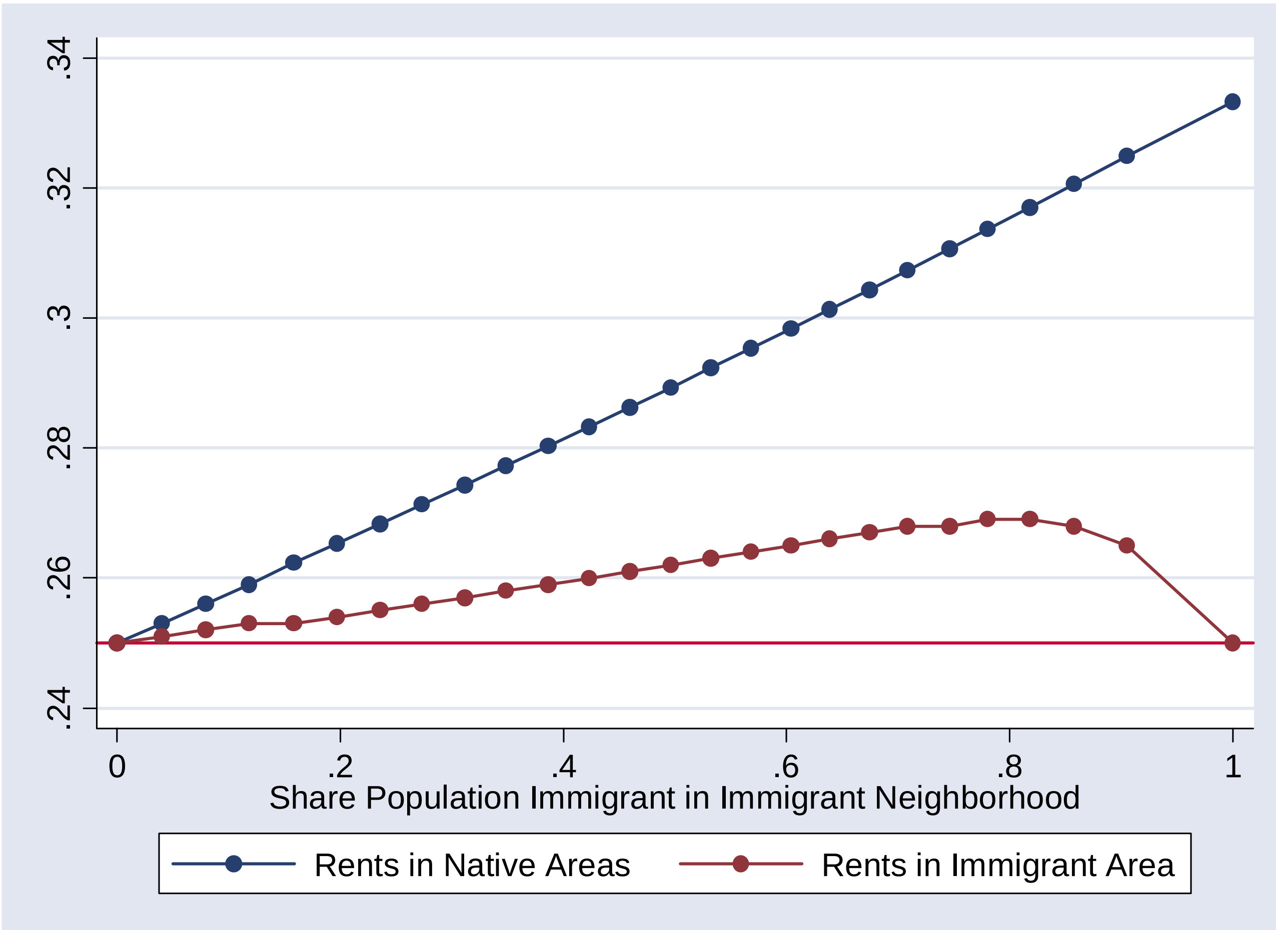

Figure 2

Nonlinearities?

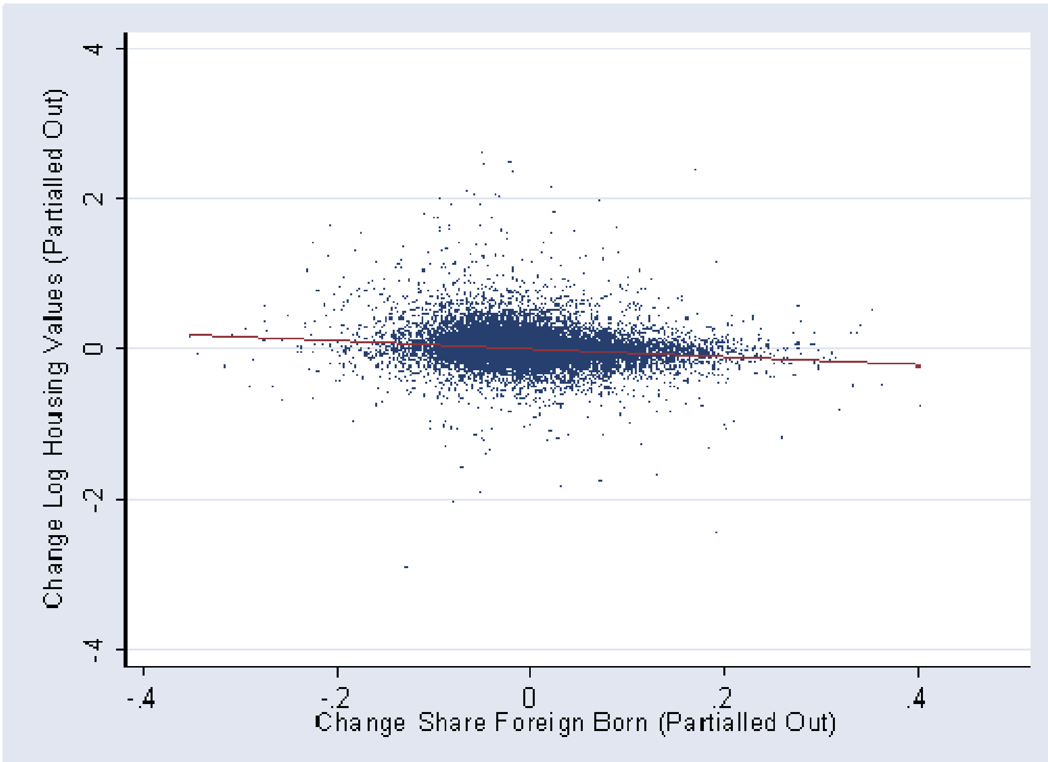

Figure 3

Diffusion of Immigrant Density (cities with growing immigration)

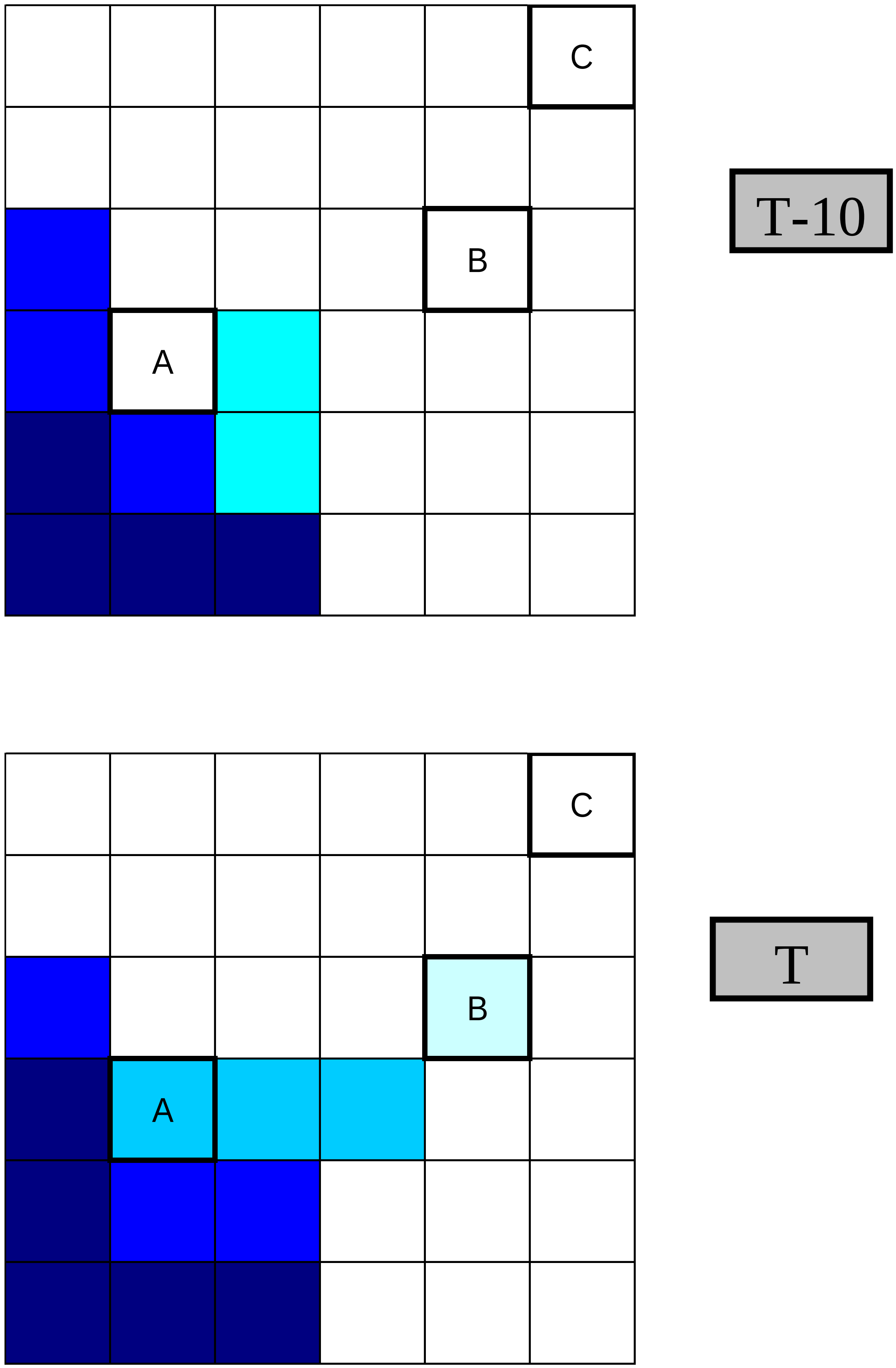

Figure 4
Spatial Correlation in Immigrant Settlement

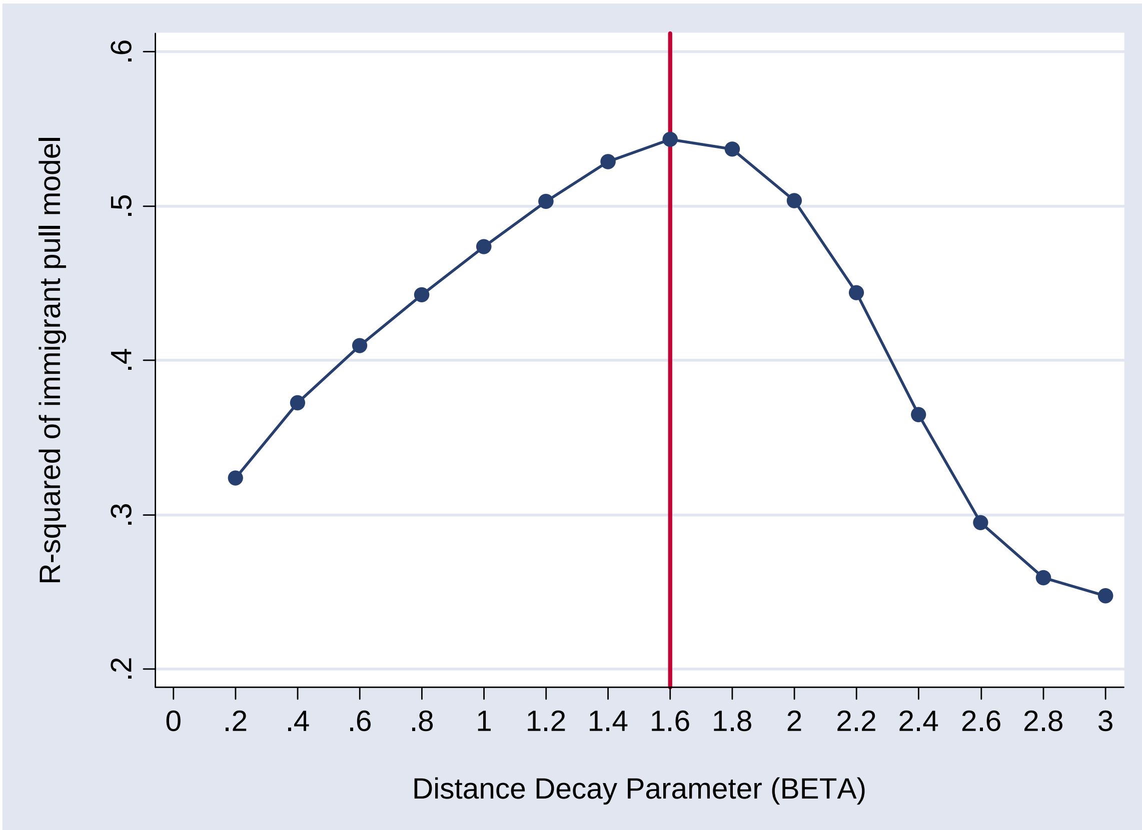

Figure 5
Power of IV Instrument

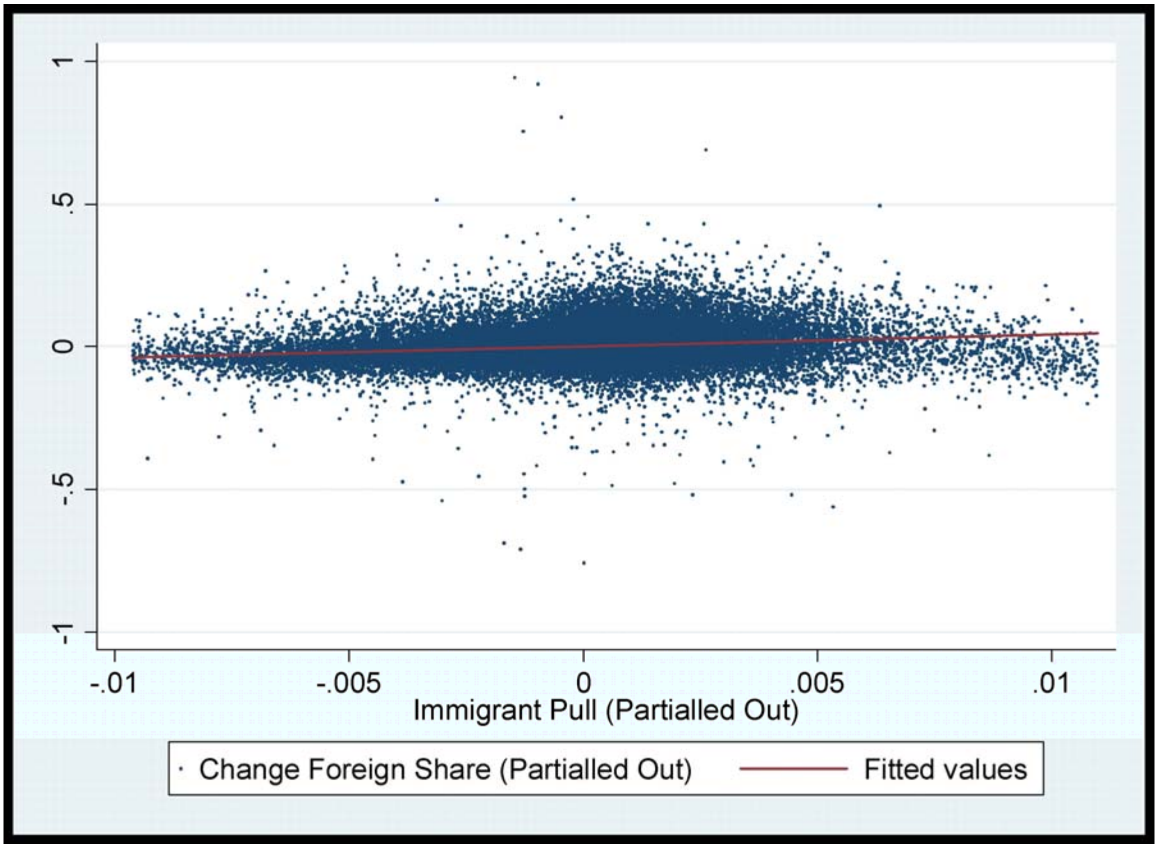

Figure 6

Diffusion of Immigrant Density. Similar neighbors, different initial immigrant densities

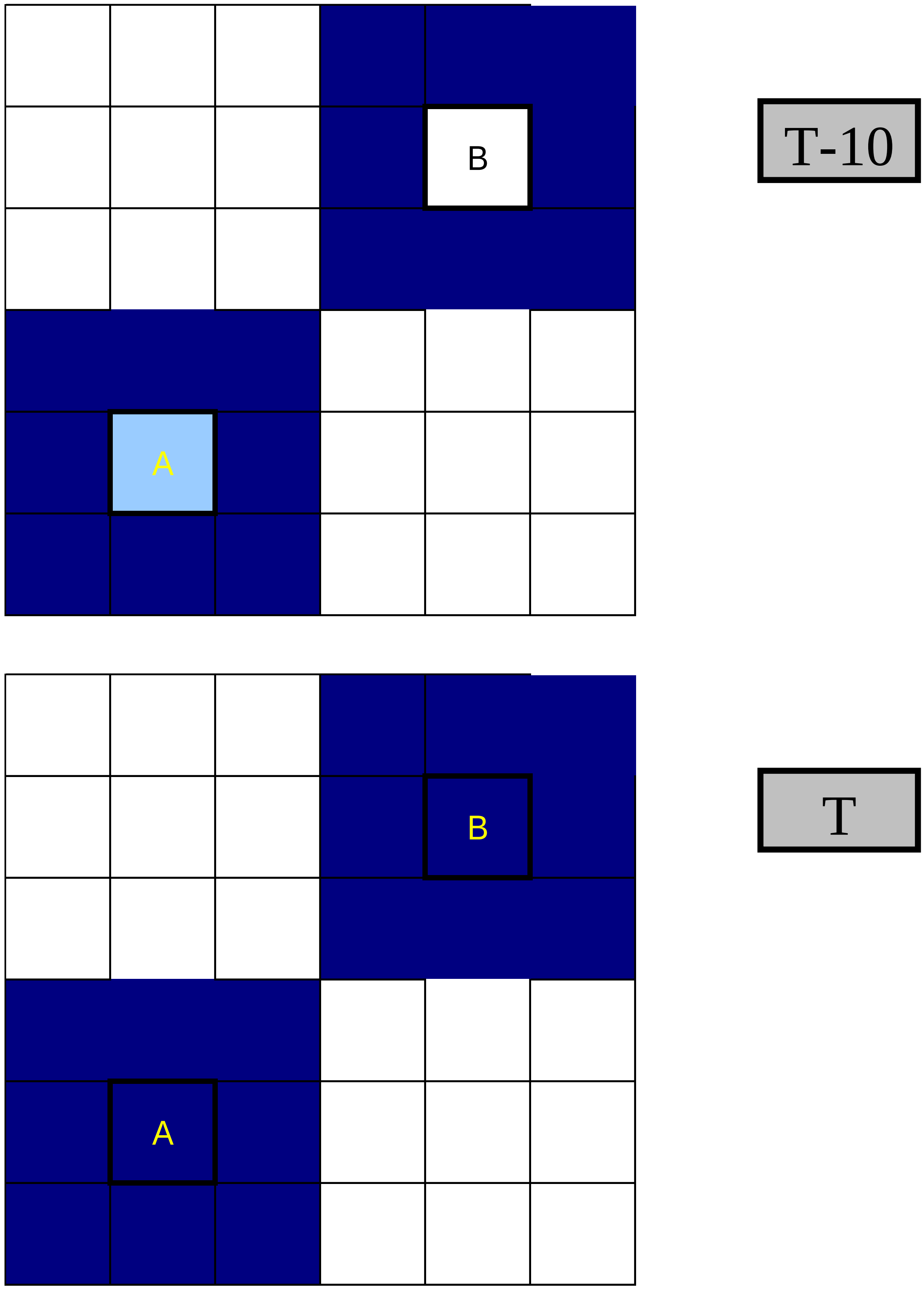

Figure 7

Diffusion of Immigrant Density. Similar neighbors, different immigration inflows at the MSA level

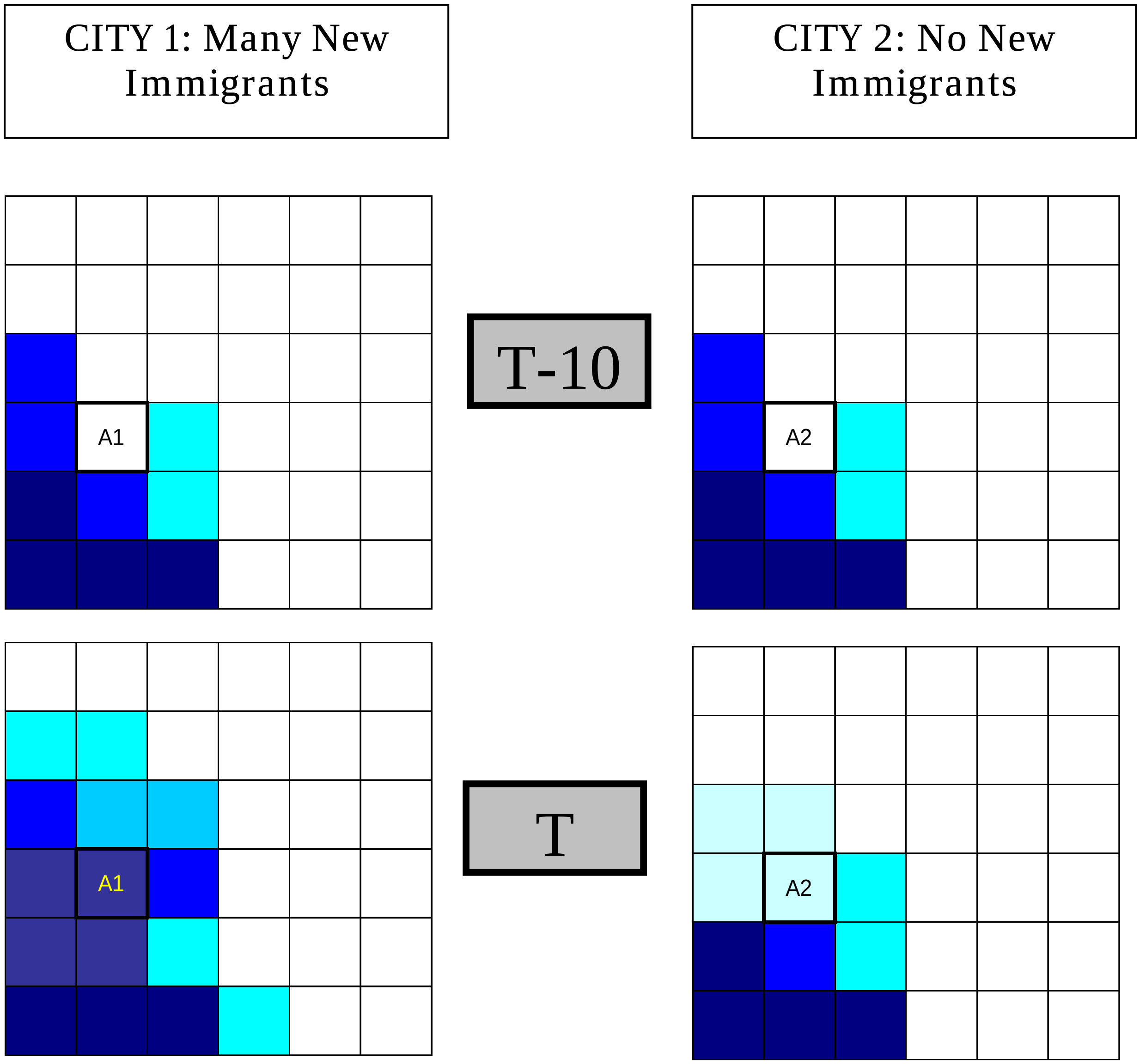

Figure 8
Changes in Immigrant Density and Relative Housing Price Growth: Channels

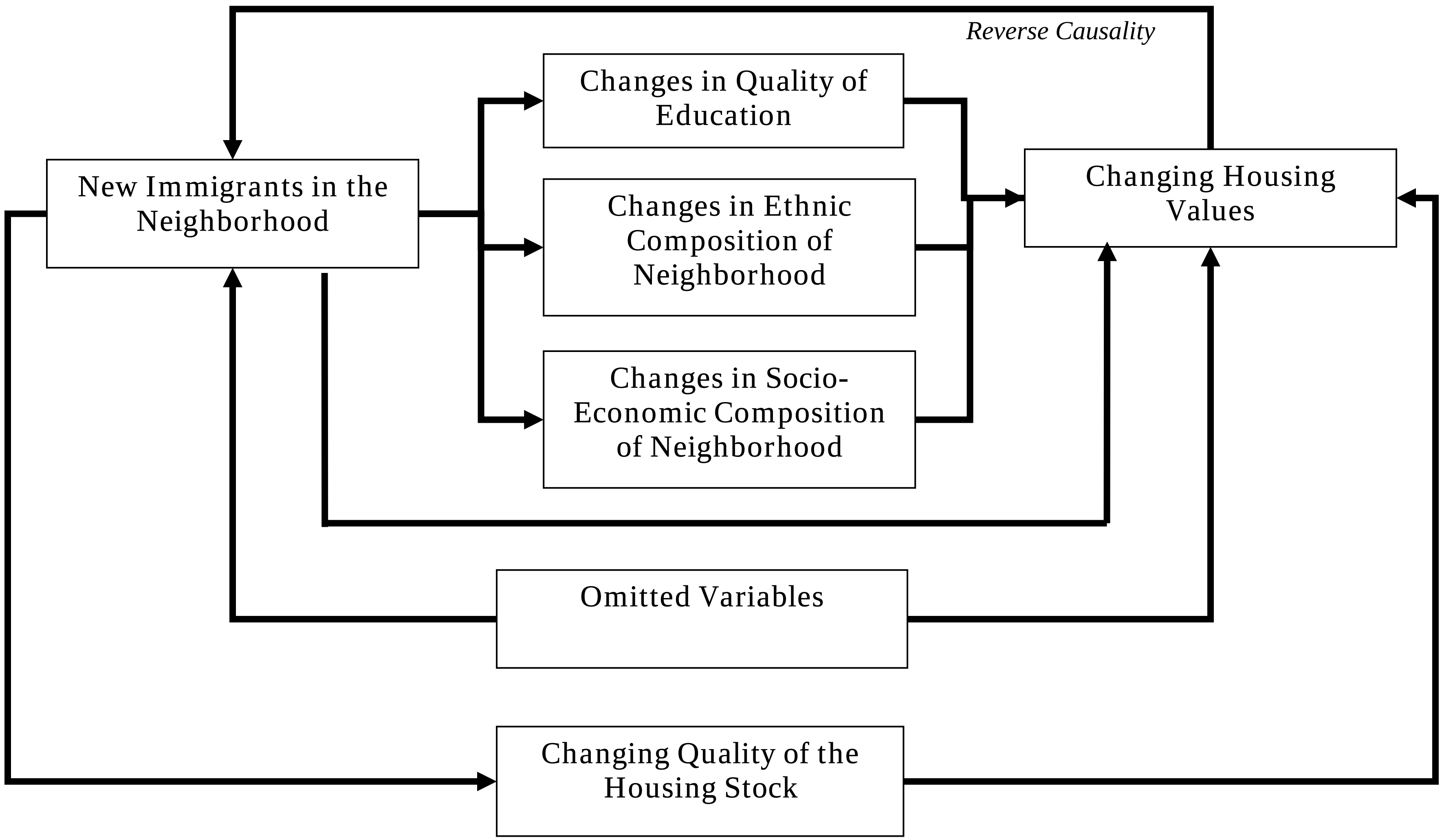

TABLE 1

Changes in the Foreign-Born Share and Neighborhood Valuation

	ΔLog Average Value					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Δ(Foreign Born/Population)	**-0.418**	**-0.246**	**-0.25**	**-0.264**	**-0.252**	**-0.244**
	(0.016)***	(0.015)***	(0.015)***	(0.015)***	(0.015)***	(0.015)***
Share with Bachelor's Degree at T-10		0.101	0.095	0.183	0.188	0.196
		(0.012)***	(0.013)***	(0.013)***	(0.014)***	(0.014)***
Log Family Income at T-10		-0.005	-0.004	0.121	0.112	0.082
		-0.007	-0.007	(0.009)***	(0.010)***	(0.011)***
Share Non-Hispanic White at T-10		0.002	-0.003	0.015	0.013	0.013
		-0.005	-0.005	(0.005)***	(0.005)**	(0.005)***
Share 24 or younger at T-10		-0.104	-0.107	-0.226	-0.226	-0.23
		(0.027)***	(0.028)***	(0.029)***	(0.030)***	(0.030)***
Share 65 or older at T-10		-0.066	-0.075	-0.07	-0.09	-0.09
		(0.021)***	(0.022)***	(0.022)***	(0.023)***	(0.023)***
Share Households Familiy+Kids at T-10		0.051	0.044	0.09	0.088	0.08
		(0.016)***	(0.016)***	(0.016)***	(0.017)***	(0.017)***
Ownership Rate at T-10 (Households)		-0.069	-0.065	-0.105	-0.105	-0.105
		(0.013)***	(0.013)***	(0.013)***	(0.014)***	(0.014)***
Vacancy Rate at T-10		0.04	0.035	0.068	0.047	0.042
		(0.022)*	-0.022	(0.023)***	(0.025)*	(0.025)*
Log Density at T-10		-0.013	-0.012	-0.012	-0.012	-0.013
		(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Share Water Land Cover (1992)			0.057	0.078	0.072	0.069
			(0.016)***	(0.017)***	(0.018)***	(0.018)***
Share Commercial, Industrial, Mining Land Cover (1992)			-0.037	-0.041	-0.04	-0.042
			(0.009)***	(0.009)***	(0.010)***	(0.010)***
Log Average House Value at T-10				-0.166	-0.155	-0.147
				(0.008)***	(0.008)***	(0.008)***
Change in Log Value at T-10					-0.01	-0.021
					(0.004)**	(0.005)***
Change in Log Family Income at T-10						0.062
						(0.008)***
MSA-Year Fixed Effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Change in Housing Quality	*no*	*yes*	*yes*	*yes*	*yes*	*yes*
Housing Quality at T-10	*no*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	34,833	34,833	34,492	34,492	30,948	30,947
R-squared	0.79	0.85	0.85	0.85	0.86	0.86

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The table shows regressions where the change in the log of average housing prices between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variable of interest is the change in the share of the foreign-born by tract between consecutive census years. All regressions include fixed effects for each Metropolitan Statistical Area (MSA) and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods. The average tract housing quality attributes are itemized in Appendix Table 1.

TABLE 2

Further Results

	ΔLog Average Value: Native Neighborhoods	ΔLog Median Value (1990-2000)	ΔLog Average Value: Stratified Sample Average	ΔLog Average Value
	(1)	**(2)**	**(3)**	**(4)**
Δ(Foreign Born/Population)	**-0.276**	**-0.278**	**-0.221**	**-0.245**
	(0.027)***	(0.057)***	(0.021)***	(0.015)***
(Foreign Born/Population) at T-10				-0.028
				(0.012)**
MSA-Year Fixed Effects	*yes*	*yes*	*yes*	*yes*
Change in Housing Quality	*yes*	*yes*	*yes*	*yes*
Housing Quality at T-10	*yes*	*yes*	*yes*	*yes*
Other variables in Table 1, Column 2	*yes*	*yes*	*yes*	*yes*
Observations	17,364	21,681	34,833	34,833
R-squared	0.85	0.39	-	0.85

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The table shows regressions where the change in the log of average (columns 1,3, and 4) or median (column 2) housing prices between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variable of interest is the change in the share of the foreign-born by tract between consecutive census years. All regressions include fixed effects for each Metropolitan Statistical Area (MSA) and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods. The average tract housing quality attributes are itemized in Appendix Table 1.

TABLE 3

Immigrants and Housing Quality/Investments (AHS: 2001-2005)

	Total renovation costs		Open cracks wider than a dime		Large peeling paint areas		Water leak in basement		At least one room lacking electrical plugs		Neighborhood has neighborhood crime	
Foreign-Born Dummy (OLS/logit)	70.032	2.458	-0.079	-0.048	-0.119	-0.025	-0.572	-0.523	-0.092	-0.166	-0.066	-0.058
	(52.541)	(69.883)	(0.068)	(0.080)	(0.100)	(0.114)	(0.069)***	(0.080)***	(0.117)	(0.144)	(0.036)*	(0.043)
Foreign-Born Dummy (Logit FE)	210.02	123.355	-0.214	-0.162	0.618	0.635	-0.137	-0.147	-0.395	-0.381	-0.283	-0.27
	(259.796)	(259.423)	(0.221)	(0.227)	(0.396)	(0.413)	(0.237)	(0.241)	(0.389)	(0.404)	(0.140)**	(0.142)*
	Windows covered with metal bars		Windows broken		Holes/cracks or crumbling in foundation		Roof has holes		Roof missing shingles/other roofing materials		Outside walls missing siding/bricks/etc.	
Foreign-Born Dummy (Logit)	1.298	1.374	-0.136	-0.189	-0.242	-0.235	0.011	-0.028	0.08	0.117	-0.083	-0.02
	(0.049)***	(0.059)***	(0.073)*	(0.088)**	(0.086)***	(0.105)**	(0.097)	(0.117)	(0.064)	(0.074)	(0.083)	(0.097)
Foreign-Born Dummy (Logit FE)	0.247	0.279	-0.534	-0.553	0.07	0.097	-0.071	0.009	0.245	0.278	0.051	0.078
	(0.268)	(0.280)	(0.325)	(0.346)	(0.339)	(0.347)	(0.401)	(0.416)	(0.236)	(0.239)	(0.299)	(0.304)
	Roof's surface sags or is uneven		Outside walls slope/lean/slant		Evidence of rodents		Garage or carport with unit		Holes in floor		Neighborhood has bad smells	
Foreign-Born Dummy (Logit)	-0.183	-0.22	-0.29	-0.251	-0.497	-0.475	0.14	0.16	-0.168	-0.149	-0.041	-0.018
	(0.091)**	(0.108)**	(0.125)**	(0.146)*	(0.034)***	(0.041)***	(0.028)***	(0.035)***	(0.150)	(0.176)	(0.057)	(0.066)
Foreign-Born Dummy (Logit FE)	-0.34	-0.33	0.659	0.878	0.064	0.062	-0.013	0.011	0.448	0.346	-0.078	-0.102
	(0.377)	(0.389)	(0.512)	(0.563)	(0.124)	(0.125)	(0.180)	(0.183)	(0.571)	(0.591)	(0.217)	(0.219)
Other Controls	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes

Notes:
Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
The table displays the coefficient on a foreign-born dummy variable in separate regressions where a number of quality indexes are in the left-hand side. The foreign-born dummy takes value one if at least one member in the household is foreign born. The coefficients correspond to the parameter estimates in logit specifications, except in the case of renovation costs (OLS). The coefficients in the left of each set of regressions correspond to specifications where the only controls are the foreign-born dummy and year fixed effects. The coefficients in the right of each set of regressions correspond to specifications where we control for income, marital status, gender and age of reference person, year fixed effects, and a dummy for recent movers. The Logit and OLS regressions include data from the 2001, 2003, and 2005 waves of the AHS (upper rows). The fixed effect Logit specifications (bottom rows) consider only the subset of housing units that appear in both the 2001 and 2005 samples, and include housing unit fixed effects.

TABLE 4

Geographic Gravity Pull Instrument

	ΔLog Average Value				
	(1)	(2)	(3)	(4)	(5)
Δ(Foreign-Born/Population)	**-0.346** (0.082)***	**-0.323** (0.136)**	**-0.181** (0.150)	**-0.211** (0.050)***	**-0.214** (0.054)***
Share Foreign-Born at T-10			-0.031 (0.013)**	-0.029 (0.012)**	-0.030 (0.013)**
Gravity Pull+					0.063 (0.299)
Other variables in Table 1, Column 2	*no*	*yes*	*yes*	*yes*	yes
MSA-Year Fixed Effects	*yes*	*yes*	*yes*	*yes*	*yes*
Instruments	*Gravity Pull*	*Gravity Pull*	*Gravity Pull*	*Gravity Pull, Gravity Pull • MSA Immigration, Gravity Pull • Share Foreign Born at T-10*	*Gravity Pull, Gravity Pull • MSA Immigration, Gravity Pull • Share Foreign Born at T-10*
F-test of excluded variables	76.01	30.9	22.12	365.09	339.87
Hansen Overidentification Test (p-values)				0.95	0.80
N	34,833	34,833	34,833	34,833	34,833

Notes:
Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
+ As defined in text and divided by 1,000,0000
The table shows regressions where the change in the log of average housing prices between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variable of interest is the change in the share of the foreign born by tract between consecutive census years. This variable is instrumented with the immigrant "gravity pull" variable (columns 1, 2, and 3), and interactions of the latter variable with initial levels of immigrant density in the tract and the level of immigration in the last decade by Metropolitan Statistical Area (MSA) relative to the initial MSA population (columns 4 and 5). "Gravity pull" is defined - for each census tract - as a weighted average of immigrant densities in neighbouring census tracts at T-10, where the weights are directly proportional to the area of the neighboruing tract and inversely porportional to the distance between the tracts. All regressions include fixed effects for each MSA and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods.

TABLE 5

Immigrant Inflows and Native Mobility (Within MSA)

	(ΔNative Population)/ (Population at T-10)		(ΔNon-Hispanic White Population)/ (Population at T-10)	
	(1)	**(2)**	**(3)**	**(4)**
(ΔForeign Born)/Population at T-10	**1.244**	**-0.137**	**0.772**	**-0.675**
	(0.108)***	(0.043)***	(0.105)***	(0.045)***
Other variables in Table 5, Column 5	*yes*	*yes*	*yes*	yes
Instruments	*None*	*Gravity Pull, Gravity Pull • MSA Immigration, Gravity Pull • Share Foreign Born at T-10*	*None*	*Gravity Pull, Gravity Pull • MSA Immigration, Gravity Pull • Share Foreign Born at T-10*
N	36,847	36,847	36,847	36,847

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

+ As defined in text and divided by 1,000,0000

The table shows regressions where the change of population in especific nativity/ethnicity groups between consecutive decennial censuses by census tract divided by its initial population is the left-hand-side variable. The explanatory variable of interest is the change in the number of the foreign born by tract divided by its initial population. In columns 2 and 4, this variable is instrumented with the immigrant "gravity pull" variable and interactions of the latter variable with initial levels of immigrant density in the tract and the level of immigration in the last decade by Metropolitan Statistical Area (MSA) relative to the initial MSA population. "Gravity pull" is defined as in Table 3. All regressions include fixed effects for each MSA and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods.

TABLE 6

Where does the value-immigration link matter?

	ΔLog Value		
	(1)	**(2)**	**(3)**
Δ(Foreign Born/Population)	-0.066	-0.161	-0.062
	(0.034)**	(0.019)***	(0.033)*
Δ(Foreign Population/Population) • Share Non-Hispanic White at T-10	-0.285		-0.193
	(0.050)***		(0.054)***
Δ(Foreign Population/Population) • House Value Quartile at T-10		-0.075	-0.057
		(0.013)***	(0.014)***
MSA-Year Fixed Effects	*yes*	*yes*	*yes*
Change in Housing Quality	*yes*	*yes*	*yes*
Housing Quality at T-10	*yes*	*yes*	*yes*
Other variables in Table 1	*yes*	*yes* ⫫	*yes* ⫫
Observations	34,833	34,835	34,835
R-squared	0.85	0.85	0.85

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

⫫ In equations 2 and 3, we substitute log of income at T-10 by log of housing values at T-10. The correlation between these variables is 0.9

The table shows regressions where the change in the log of average housing prices between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variable of interest is the change in the share of the foreign born by tract between consecutive census years. All regressions include fixed effects for each Metropolitan Statistical Area (MSA) and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods.

TABLE 7

Immigrant Density and Rents Within the City

	ΔLog Rents				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Δ(Foreign Born/Population)	-0.284	-0.079	0.035	-0.011	0.042
	(0.016)***	(0.016)***	(0.04)	(0.02)	(0.04)
Δ(Foreign Population/Population) • Share Non-Hispanic white at T-10			-0.196		-0.102
			(0.059)***		(0.062)*
Δ(Foreign Population/Population) • House Value Quartile at T-10				-0.058	-0.051
				(0.013)***	(0.014)***
MSA-Year Fixed Effects	*yes*	*yes*	*yes*	*yes*	*yes*
Change in Housing Quality	*no*	*yes*	*yes*	*yes*	*yes*
Housing Quality at T-10	*no*	*yes*	*yes*	*yes*	*yes*
Other variables in Table 1	*no*	*yes*	*yes*	*yes* ╨	*yes* ╨
Observations	21,295	21,282	21,282	20,694	20,694
R-squared	0.65	0.73	0.73	0.74	0.74

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

╨ In equations 2 and 3, we substitute log of income at T-10 by log of housing values at T-10. The correlation between these variables is 0.9

The table shows regressions where the change in the log of average housing rents between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variable of interest is the change in the share of the foreign born by tract between consecutive census years. All regressions include fixed effects for each Metropolitan Statistical Area (MSA) and year combination. The regressions include observations from all census tracts in major immigrant cities that do not have rental price controls, as defined in the text, for the 1980-1990, and 1990-2000 periods. The average tract housing quality attributes

TABLE 8

"Unbundling" Immigration

	ΔLog Value		
ΔShare Europe	0.055	-	-
	(0.049)		
ΔShare South Asia	0.017	-	-
	(0.070)		
ΔShare Cuban	-0.045	-	-
	(0.145)		
ΔShare Midle East	-0.17	-	-
	(0.161)		
ΔShare Mexico	-0.245	-	-
	(0.027)***		
ΔShare Africa	-0.289	-	-
	(0.133)**		
ΔShare East Asia	-0.322	-	-
	(0.054)***		
ΔShare China	-0.36	-	-
	(0.073)***		
ΔShare South America	-0.418	-	-
	(0.075)***		
ΔShare Caribbean	-0.55	-	-
	(0.056)***		
ΔShare Central America	-0.554	-	-
	(0.075)***		
ΔShare Dominican	-0.843	-	-
	(0.173)***		
ΔShare Philippines	-0.857	-	-
	(0.096)***		
Δ(Foreign Born/Population)	-	-0.233	
		(0.020)***	
Dropout Immigrant Shock	-	-	-0.377
			(0.163)**
Non-Hispanic White Immigrant Shock	-	-	0.267
			(0.061)***
Black Immigrant Shock	-	-	-0.494
			(0.066)***
Asian Immigrant Shock	-	-	-0.183
			(0.048)***
Hispanic Immigrant Shock	-	-	-0.042
			(0.102)
Schol District -Year Fixed Effects	*no*	*yes*	*yes*
MSA-Year Fixed Effects	*yes*	*no*	*no*
Δin Housing Quality	*yes*	*yes*	*yes*
Housing Quality at T-10	*yes*	*yes*	*yes*
Other variables in Table 1	*yes*	*yes*	*yes*
Observations	18,178	18,167	18,167
R-squared	0.76	0.82	0.83

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The table shows regressions where the change in the log of average housing prices between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variables of interest are the change in the share of the foreign born by nationality and tract between consecutive census years (column 1). In column 2 we reproduce the results in Table 1 controlling for school district fixed effects. In column 3 we use differences in average education and ethnicity by national group and State to proxy for the "shocks" on these variables by census tract that are associated with immigration. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1990-2000 period.

Appendix TABLE 1

Descriptive Statistics

Variable	Mean (S.D.)	Variable	Mean (S.D.)	Variable	Mean (S.D.)
Change in log value	0.478 (0.421)	Change share single attached units	0.020 (0.051)	Share single detached units at T-10	0.623 (0.268)
Change in (Foreign Born/Population)	0.052 (0.072)	Change share housing units in 2 unit buildings	-0.006 (0.027)	Share single attached units at T-10	0.055 (0.088)
Change share units with no bedrooms	0.008 (0.023)	Change share housing units in 3-4 unit buildings	0.002 (0.031)	Share housing units in 2 unit buildings at T-10	0.048 (0.092)
Change share units with 1 bedroom	0.003 (0.057)	Share units with no bedrooms at T-10	0.020 (0.037)	Share housing units in 3-4 unit buildings at T-10	0.045 (0.061)
Change share units with 2 bedrooms	-0.015 (0.072)	Share units with 1 bedroom at T-10	0.148 (0.124)	Share with bachelor's degree at T-10	0.208 (0.143)
Change share units with 3 bedrooms	-0.006 (0.074)	Share units with 2 bedrooms at T-10	0.299 (0.146)	Share high school drop outs at T-10	0.269 (0.161)
Change share units with 4 bedrooms	0.004 (0.052)	Share units with 3 bedrooms at T-10	0.369 (0.157)	Log family income at T-10	10.156 (0.348)
Change share units with electric heating	0.057 (0.098)	Share units with 4 bedrooms at T-10	0.138 (0.123)	Share white at T-10	0.815 (0.228)
Change share units with oil heating	-0.029 (0.070)	Share units with electric heating at T-10	0.227 (0.246)	Share 25 or younger at T-10	0.388 (0.093)
Change share units with gas heating	-0.025 (0.105)	Share units with oil heating at T-10	0.089 (0.194)	Share 65 or older at T-10	0.112 (0.099)
Change share units with complete plumbing	0.005 (0.015)	Share units with gas heating at T-10	0.630 (0.312)	Share households family + kids at T-10	0.364 (0.150)
Change share units with complete kitchen facilities	0.006 (0.017)	Share units with complete plumbing at T-10	0.990 (0.020)	Ownership rate at T-10 (households)	0.672 (0.208)
Change share units built 10 years ago or less	-0.116 (0.208)	Share units with complete kitchen facilities at T-10	0.987 (0.020)	Vacancy rate at T-10	0.063 (0.064)
Change share units built 20 years ago or less	-0.021 (0.233)	Share units built 10 years ago or less at T-10	0.308 (0.276)	Log density at T-10	7.092 (1.570)
Change share units built 30 years ago or less	-0.011 (0.220)	Share units built 20 years ago or less at T-10	0.244 (0.166)		
Change share single detached units	-0.025 (0.100)	Share units built 30 years ago or less at T-10	0.210 (0.172)		

Appendix TABLE 2
2SLS: First Stage

	Change in (Foreign Born/Population)			
	(1)	**(2)**	**(4)**	**(5)**
Estimated Immigrant Gravity Pull	3.349	1.909	1.85	2.699
	(0.384)***	(0.343)***	(0.393)***	(0.993)***
Foreign Population at T-10/Population at T-10			0.007	0.292
			(0.009)	(0.010)***
Estimated Immigrant Gravity Pull Share Foreign Born at T-10				-17.243
				(0.735)***
Gravity Pull • (MSA Immigrants/Initial Population)				31.877
				(4.373)***
MSA-Year Fixed Effects	*yes*	*yes*	*yes*	*yes*
Other Variables in Table 1, Column 2	*no*	*yes*	*yes*	*yes*
Observations	35,134	35,120	35,120	35,120
R-squared	0.12	0.27	0.27	0.32

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The table shows the first-stage regressions of the 2SLS approach in Table 4. The instrumented variable of interest is the change in the share of the foreign born by tract between consecutive census years. The instruments are the immigrant "gravity pull" (as described in Table 4 and the text) and interactions of the latter variable with initial levels of immigrant density in the tract and the level of immigration in the last decade by Metropolitan Statistical Area (MSA) relative to the initial MSA population. All regressions include fixed effects for each MSA and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods.

Appendix TABLE 3

Alternative Instrument: Changes in Pull, and Nonlinearities in Lagged Density

	Change in Log Average Value	
	(1)	**(2)**
Change in (Foreign Born/Population)	**-0.324** (0.098)***	**-0.163** (.046)**
Share Foreign-Born at T-10		-0.031 (0.012)***
Other variables in Table 1, Column 2	*yes*	*yes*
MSA-Year Fixed Effects	*yes*	*yes*
Instruments	*ΔGravity Pull*	*(Share Foreign-Born at T-10)* ^{2,} *Share Foreign-Born at T-10 • Immigrants per Capita in MSA*
F-test of excluded variables	5.56	819.44
N	34,833	34,833

Notes:

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The table shows regressions where the change in the log of average housing prices between consecutive decennial censuses by census tract is the left-hand-side variable. The explanatory variable of interest is the change in the share of the foreign born by tract between consecutive census years. This variable is instrumented with the change in immigrant "gravity pull" variable (column 1), as defined in Table 3. In column 2 the instruments are the interaction between a quadratic in lagged immigrant shares, and the number of immigrants in the MSA divided by lagged MSA population. All regressions include fixed effects for each MSA and year combination. The regressions include observations from all census tracts in major immigrant cities, as defined in the text, for the 1980-1990, and 1990-2000 periods.

Appendix TABLE 4

Main SES Characteristics by World Region

World Region	Percent Dropout	Percent with Bachelor's Degree	Percent Minority (Hispanic or Nonwhite)
Africa	7.18	45.95	68.83
South Central Asia	10.57	60.70	94.32
Philippines	12.08	44.68	96.43
Middle East	13.70	43.05	11.68
South America	18.77	23.01	88.54
Caribbean	21.09	15.87	97.04
China	21.54	44.99	97.91
East Asia	21.73	28.33	94.23
Europe	22.33	24.96	7.69
Other	31.56	22.92	56.79
Cuba	33.39	17.51	98.37
Dominican Republic	45.56	8.98	99.01
Central America	46.31	9.32	96.34
Mexico	65.46	4.20	99.18