The Link between Immigration and Native Out-Migration in the U.S., 1995 – 2000

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A thesis
submitted in partial fulfillment of the
requirements for the degree of

Master of Arts

University of Washington
2012

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Program Authorized to Offer Degree:
Sociology

University of Washington
Graduate School

This is to certify that I have examined this copy of a master's thesis by

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Acknowledgements

Thank you to all of those who provided guidance, feedback, and encouragement as I struggled through this thesis project, my first real attempt at original research. In particular, I thank the members of the 2011-2012 MA Thesis Seminar: Ross Cantor; Lindsay Carvalho; Matt Kopas; Ursula Mosqueira; and, of course, our insightful and conscientious leader, Aimée Dechter. I hope you found my presence in the seminar as helpful as I found yours. I also thank the members of my committee, Stew Tolnay and Kyle Crowder, for their time, pointed feedback, and seemingly inexhaustible patience and work ethic. Finally, I would like to acknowledge my use of the abundant, yet often underutilized, resources offered by the Center for Studies in Demography and Ecology.

Dedication

This work is dedicated to those who have shaped me, for better or worse, into the person I am: to my grandfather, who taught me to do things right the first time; to my grandmother, whose weekly calls keep me abreast of the weather back home; to my mother, in whose eyes I am still a baby; to my father, who endures 7/12s for weeks on end without complaint; to my brother, who is so much smarter than I can ever hope to be; and, most of all, to my wife, who has given me everything and more.

Introduction

The post-1965 era of immigration to the United States has been a topic of much popular debate and scholarly research. An important line of inquiry for sociologists, demographers, and policy makers alike has explored the economic, social, and demographic effects of these "new-wave" immigrants. A key question in this field of research concerns the migratory reaction of native-born Americans to immigration dynamics.

The link between immigration and native migration has been heavily debated and no consensus has been reached. While some posit that natives in general – and poorer, less-skilled natives in particular – tend to migrate away from places receiving relatively large numbers of immigrants, other research fails to find this connection. In fact, some studies find that after controlling carefully for population size and de-industrialization natives are disproportionately attracted to places with high immigration.

This research contributes to this debate by considering contemporary migration patterns in the U.S. Using county-level economic, socio-demographic, and geographic data, I predict native out-migration counts as a function of immigration and a number of place characteristics. I also consider the distance traveled by migrants as a function of immigration in counties surrounding the origin county. Results suggest that immigration, as well as pre-existing immigrant population size, does have a positive effect on native out-migration. Consistent with prior research noting the important effects of economic restructuring and deindustrialization, the immigrant effect is tempered – but remains robust – after controlling for key indicators of economic growth. Further supporting the link between immigration and migration is evidence that suggests the immigrant presence in counties surrounding the county of origin increases the distance natives migrate. Substantively, these results offer evidence in support of the hypothesis that natives continue to "flee" from the areas to which immigrants are most drawn.

Literature Review

The Immigration-Migration Link

The post-1965 era of immigration to the United States changed the face of the nation and prompted public and scholarly debate. Between the passing of the 1965 Immigration and Nationality Act and the 2000 Census, the U.S. foreign-born population tripled, growing from less than 10 million to more than 30 million. Over the same period, the foreign born share of the US population climbed from 5 to 11 percent (Hirschman 2005). Demographic changes like these continue to both surprise demographers and policy makers (Reimers 1998) and generate questions regarding the effects of shifting immigration patterns. Early work on the implications of immigration scrutinized popular claims that immigrants negatively impacted native laborers by stealing jobs and deflating wages (Walker, Ellis, and Barff 1992; Borjas, Freeman, and Katz 1996). Despite the fears and speculation, early findings indicated that immigration had little to no effect on jobs or wages. As noted by Borjas, et al. (1996), however, a major assumption of these studies is that labor pools in areas under consideration were static.

Frey's (e.g. 1996) "balkanization" hypothesis cast doubt on this central assumption, leading some to suspect that the negative effects of immigration on native labor markets were understated because of the out-migration of natives congruent with the influx of immigrants. Frey (1996) brought this debate to the fore when he noted that, in the late 1980s and early 1990s, the states whose migration flows were dominated by immigration saw the net out-migration of native-born Americans. Immigration, coupled with the net out-migration of native populations, he argued, contributed to demographic "balkanization" across the U.S. – a process by which high-immigration places experience increasing bifurcation in race and class structures (Frey 1996). The "push" generated by immigration in high-immigration states differed by race and education level, however. Frey, Liaw, Xie, and Carlson (1996) noted that whites and blacks with a high school education or less were more likely to migrate out of the classic port-of-entry states than their more educated counterparts.

Frey (1995) hypothesized that two different domestic migration processes explained both the net out-migration of native populations and the differential migration rates of natives by education level in the nation's immigrant destinations. Circa 1990 California provided an exemplary case for testing the relationship between education and native migration responses, as it was one of the largest immigrant destination states in the 1980s and experienced a net out-migration of natives. Frey's (1995) results suggest that education conditions native responses to immigration. While college-educated Californian natives achieved a net in-migration rate between 1985 and 1990, those with a high school education or less out-migrated in the net. When immigrant flows are dominated by low-skilled workers – as they were in California in the late '80s – the out-migration of less educated natives tended to outweigh the in-migration of more educated natives from surrounding states, creating a net out-migration of the native population.

While overt racism and xenophobia on the part of natives may explain some of the native "flight" reaction, immigration scholars noted that the immigration-migration link was likely driven by labor market competition between immigrants and natives of similar skill levels. According to these "substitution" arguments, labor market competition in major immigrant destinations worked so as to replace native workers with immigrants; each new immigrant effectively knocked a native out of the work force, precipitating the out-migration of less educated natives. Filer's (1992) study of metropolitan migration between 1975 and 1980 found that immigration had a significant negative effect on the native net migration rate, net of other factors such as local amenities, demographic characteristics, and some indicators of economic vitality. In a state-level examination of individual likelihoods of out-migration in the 1980s, White and Liang (1998) found the likelihood of native outmigration increased significantly with larger recent immigrant inflows. Interestingly, controlling for a number of individual characteristics, individual probabilities of out-migration were smaller in states with larger pre-existing immigrant populations. The magnitude of both of these effects was larger for whites than for blacks. At any rate,

these findings were consistent with the idea that influxes of immigrants caused the out-migration of natives and reiterated the role of education in determining native propensities to migrate.

Despite these findings, other studies of the immigration-migration link failed to identify any significant association between immigration inflows and native migration. Card (1997), in an analysis of metropolitan areas in the 1980s and 1990s, assessed the impact of immigration on native outmigration by grouping both immigrants and natives according to skill-set and education characteristics. Results showed that native (and more established immigrant) migration between metro areas was largely insensitive to immigration forces. This suggested that the "substitution" labor market hypothesis was flawed, as competition in the labor market did have an effect on wages, but not on native migration (Card 1997: 56). Similar research by Card and DiNardo (2000) suggested that while immigration does lead to a shift in the skill distribution in metropolitan areas, it has no effect – or perhaps a *positive* effect – on the net migration of natives with comparable skills.

These studies lend credence to a less competitive "complementary" labor market process by which deindustrialization and economic restructuring in the nation's immigrant hubs encouraged the net out-migration of natives and the in-flow of immigrants simultaneously. In some cases, after accounting for the effects of economic restructuring, immigration is actually associated with the net in-migration of natives with similar skill sets (Card and DiNardo 2000). White and Imai (1994) separate the net-migration rate into its constituent in- and out-migrant flows for natives and find that in-migration by natives is *positively* associated with immigration, while native out-migration is *negatively* associated with immigration for the late 1960s and 1970s. Wright, Ellis, and Reibel (1997) model this complementary process very specifically and are careful to point out that what Frey and others point to as a "high immigration" phenomenon may, in reality, be a phenomenon associated with large places. Looking at the 100 largest metro areas in the U.S. between 1980 and 1990, Wright et al. (1997) demonstrate that there is little connection between immigration and the migration of natives with similar education levels, and that findings are strongly influenced by the largest metropolitan areas, such as New York and Los Angeles.

This analysis by Wright et al. (1997) illustrates, among other things, the importance of separating the effects of immigration from the correlated characteristics of places with larger populations.

The connection between immigration and migration is further complicated by residential mobility studies which examine the micro-level migration processes that may contribute to larger macro-level phenomena. Studies of residential mobility have long noted how race structures patterns of locational attainment in metropolitan areas (Alba and Logan 1991; South and Crowder 1997; Crowder and South 2005, 2008). Crowder, Hall, and Tolnay (2011) have considered the role of immigration in residential mobility, and note that immigration to the neighborhood of origin increases natives' probability of out-migration. This probability is tempered, however, by the immigrant presence in neighboring tracts – high immigration in the closest potential destination neighborhoods tends to curb out-migration from the origin tract (Crowder, et al. 2011). The dampening effect associated with immigration to neighboring tracts may lead to the underestimation of immigration effects in origin places if not sufficiently controlled.

Inconsistent Findings

The inconsistent findings regarding the link between immigration and migration above are largely attributable to differences in methodology and in the measurement of immigration and migration (Kritz and Gurak 2001). First, a key difference between many studies listed above concerns the dependent variable. While many predict *net* migration rates as a function of state, local, and/or individual characteristics (e.g. Frey 1996; Wright, et al. 1997), others focus on the constituent parts of the net migration rate – namely the *in*- and *out*-migration rates or counts of natives (White and Imai 1994; Card 1997). Studies analyzing net rates have the advantage of speaking directly to the "balkanization" processes Frey originally described; the immigration-migration link was thought to produce increased demographic polarization in the places to which immigrants were most attracted. Studies examining in- and out-migration rates, on the other hand, allow a more nuanced look at how the immigration-migration link works and arrive at slightly different conclusions. A second consideration is that of how immigrant or nativity status is defined. Some prior studies have included "long-term" immigrants (those residing in the

U.S. for at least five years) in the native population (Card 2001:24-25), while others have treated these more established immigrants as immigrants, nonetheless. These differences may have an effect on final results. A final consideration concerns the operationalization of immigration. Immigration to a place may be operationalized as a simple count. Counts of immigrants, however, allow place size to have an overwhelming effect in models, as immigrants are often attracted to the largest metropolitan areas. A more common operationalization of immigration involves constructing an immigration rate; such a rate includes the count of immigrants, normalized by the population or size of the labor force. It is the latter of these that Wright, Ellis, and Reibel (1997) conclude is most appropriate.

Inconsistencies are also attributable, in part, to the various geographies examined. Frey originally discussed the immigration-migration link on the state level. Others also conducted state-level analyses and generally found a positive association between immigration in-flows and native out-flows. Responses to these findings often focused as closely as possible on individual labor markets in order to get a more fine-tuned level of analysis, and therefore focused on metropolitan areas. Results of these metro area studies were slightly more mixed, but tended to find no significant immigration-migration link. Noting the incomparability of studies of large and small geographies, some studies also analyzed the immigration-migration link on an intermediate level, namely at the county level (e.g. Frey 1996). While these various reports speak to specific aspects of the immigration-migration link and choose geographies accordingly, resulting discrepancies cloud our understanding of this important phenomenon.

Re-examining the Immigration-Migration Link

Out-Migration rather than Net-Migration

This analysis attempts to address a number of these methodological issues in order to analyze the association between immigration and native out-migration. Unlike many other past studies, rather than focusing on net-migration, I examine the determinants of native out-migration only. This approach has the unique advantage of capturing native migratory reactions spurred by immigration which may remain hidden in net-migration counts in the event that in-migration eclipses out-migration. This may be especially important for larger cities in which immigration is high, but population turnover is also high and economic restructuring may pull in larger numbers of educated native workers. Moreover, demographic "balkanization" relies, to a large extent, on the flight of natives from immigrant populations. Recent shifts to "new" immigrant destinations notwithstanding, a handful of metropolitan areas remain migration magnets for immigrants. As illustrated by Frey's (1995) California case-study, the relatively new and meaningful phenomenon is the out-migration of native populations in response to immigration. Focusing on out-migration, then, is of pivotal importance.

New Immigrant Destinations

In addition to focusing specifically on out-migration, I also incorporate insights from a growing literature on the emergence of new immigrant destinations. Beginning in the mid-1990s, the "New Wave" of immigration began to shift dramatically. Immigrants, from Latin America in particular, began to settle in "non-traditional" destinations with little or no existing immigrant populations (Massey 2008). Mirroring the unpredictability of the post-1965 immigration wave in general, immigrants settled in states – such as Georgia, Michigan, North Carolina, and Pennsylvania – and in non-metropolitan areas that previously had little or no immigrant presence. At the same time, immigration to traditional immigration states, like New York and California, slowed slightly (Massey and Capoferro 2008).

Immigration to "new" destinations represents a relatively small proportion of all moves made by foreign-born migrants, but immigration in these destinations produces extremely high rates of immigrant growth. Such unprecedented growth holds poignant implications for "new" destinations. Table 1 decomposes foreign-born immigration to and migration within the U.S. by the origin of the move (either from abroad or from within the US, respectively) and by the characteristics of the destination county (metropolitan status and crude categories delimiting the percent of the population foreign-born in 1990). Roughly half of all counties in the U.S. are less than 1 percent foreign-born and are, for the purposes of this table, designated as having "low" proportions foreign-born. Only a handful of "high" percentage counties have foreign-born populations making up at least 6 percent of their total population, and the remaining "average" counties rank somewhere between these two extremes. Table 1 highlights the impact that shifting destination choices have had for overall trends in immigration. High percentage foreign-born counties received 68 percent of all immigrant moves, while average counties received roughly 30 percent. Non-Metro and "low" counties rank much lower than other destinations in terms of capturing a proportionate share of immigrant moves, receiving only 3 percent of all immigrating or migrating foreign born. Nevertheless, these relatively small shifts represent major demographic changes in these places. The average "low" percent foreign-born county saw over 200 percent growth in its foreign-born population between 1990 and 2000, compared to 95 percent growth nationally.

While much work has been done to identify these new destinations and understand the socioeconomic characteristics of the new immigrants (Massey 2008), native reactions to them remain largely unexamined, save for selective ethnographic accounts (Fennelly 2008; Griffith 2008; Marrow 2008). The results of these accounts highlight the fact that natives' reactions to new immigrants are mixed and depend upon the demographic composition of both native and immigrant populations, as well as the place under study. To my knowledge, there have been no nationally-inclusive analyses of the potential migratory response of natives to new immigrants at a finer geographic level than the state. This analysis

attempts to fill this gap in the literature by explicitly including all U.S. counties at a relatively refined level of detail.

On Using Counties as the Unit of Analysis

Because many of the new destinations for immigrants are rural and non-metropolitan, I model native out-migration responses to immigration at the county level. This choice offers a few distinct advantages. First, while previous state analyses have allowed the inclusion of the entire U.S., county-level analyses allow for all new and growing immigrant destinations at a considerable level of geographic detail. Second, modeling the link at the county level allows the use of copious and readily-available data. These data include not only important migration estimates from the U.S. Bureau of Census, but also a wealth of economic and socio-demographic characteristics. Third and most importantly, however, counties provide the ideal, intermediate level of analysis for examining the immigration-migration link. State analyses, while allowing us to assess the "balkanization" hypothesis very broadly, mask a large number of short-distance, in-state moves. Such large units of analysis overlook the possibility that natives can "flee" the foreigner by moving to a nearby town or neighborhood. The metro area, while suitable for identifying precisely the mechanisms that may contribute to migration, do not allow us to examine the effects of immigration in non-metro and most "new" destinations. The county – located between these two extremes – allows for a first glimpse into native migratory responses in non-metro, "new" destinations.

The choice of counties places certain limitations on this analysis, however. Counties do not necessarily approximate labor markets, which an analysis like this should arguably hope to achieve. Rather, labor markets are better defined by metropolitan areas or the commuting patterns of laborers. While some counties may contain an entire metro area, other metro areas may spread across many counties. To the degree that immigration-migration processes occur on a geographic scale larger (or smaller) than that of the county, counties may offer less than ideal glimpses into the process. Counties, while offering a wealth of data, also introduce data problems. One example of such problems, which also highlights the question of the scale at which immigration-migration processes occur, is the existence of small county-like entities

in Virginia. Many Virginian towns have obtained a county status for census purposes, but it is highly unlikely that such towns represent labor markets. As such, these types of counties are merged into their larger, surrounding neighbors. Other problems occur when county boundaries change. Alaskan counties are notorious for their quickly shifting boundaries, and they present problems that cannot be easily overcome by simply merging groups of counties together. Because of this, Alaska was simply dropped from this analysis (along with Hawaii). The final analysis includes 3, 074 of an original 3,141 counties due to the exclusion of Alaska and Hawaii and the merging of independent cities in Virginia.

Questions and Hypotheses

This thesis makes a unique contribution by focusing on the US as whole using county-level data and by analyzing counts of out-migration in particular, rather than net-migration rates. Two questions guide this thesis. First, What is the migratory reaction of native-born Americans to the new wave of immigrants? Second, How does immigration to the most accessible destinations affect the distance out-migrants move?

Despite contradictory findings in the literature, I expect immigration to have a positive influence on native out-migration, effectively "pushing" natives to new counties, net of a large set of control variables. Past studies have carefully untangled the effects of economics and immigration, showing that a failure to adequately control for economic change may overstate the immigrant effect (Wright, et al. 1997). These findings support my expectation that the introduction of economic controls will reduce the positive effects associated with immigration. Even after controlling for the important effects of economic change, I expect immigration to remain a significant and positive predictor of native out-migration. Finally, because of the hypothesized importance of immigration in determining natives' migratory patterns, the immigrant profile of counties neighboring the origin should serve as a hurdle for natives, effectively increasing the distance that native migrants travel.

Predicting Native Out-Migrant Counts

Data and Methods

The object of this analysis is mapped in Figure 1. As might be expected, migrant counts are greatest in counties with the largest populations; more natives can migrate if there are more natives present. Clusters of high out-migrant counts are apparent in southern California and along the Pacific coast, in Florida, and in New York and its outlying regions. Notably, these high counts are also located around the classic immigrant destinations of Los Angeles, Miami, and New York City. Out-migrant counts are relatively low in rural and less-populous areas. The Midwest and South exhibit noticeably fewer native out-migrants than the rest of the nation. The analysis below seeks to examine the effects of immigration net of confounding variables such as population to see if the relationships mapped in Figure 1 are still borne out.

To model these counts of native out-migrants for the entire contiguous U.S. on the county level, I rely on the US Bureau of Census Migration Files for 2000. The migration files are built from the Census long-form question asking sampled individuals where they lived five years prior to the survey. Answers to this question are weighted to reflect the larger county population, suitably rounded to protect anonymity when minority migrant flows are low, and then cross-tabulated with a number of individual and household characteristics. These files include the number of out-migrants from each US County by the nativity of the mover, providing the dependent variable for the present analysis.

Limitations of Census migration files require minor assumptions regarding the dependent variable. Since the long-form question only inquires as to respondents' residence at two points in time, there is no information regarding the frequency of moves made by an individual between 1995 and 2000. As such, individuals out-migrating from a county after 1995, but returning before 2000 would be considered non-migrants. Additionally, there is no way to differentiate between an individual moving in 1995 and one moving in 1999; the differing time of these moves may reflect differential responses to structural factors, but are treated identically. The advantages of this operationalization, however, lay in the power of

modeling out-migration specifically, as opposed to net-migration. Furthermore, this particular data source is commonly used in migration research and is the only choice for national level migration data (e.g. Frey 1995, 1996).

I model the raw counts of native out-migrants from each of the contiguous U.S. counties with a negative binomial model. Modeling raw counts of out-migrants rather than the out-migration rate, for example, is necessitated by the fact that any denominator used to construct a rate would be inherently biased by other sources of population change – not least of which may be immigration. By modeling raw counts, I ensure that such additional sources of population change remain distinct from the dependent variable.

Negative binomial estimation, like Poisson estimation, models counts of events. In this case, the event of interest is a native-born individual crossing a county line sometime within the period between 1995 and 2000. Unlike the Poisson, however, the negative binomial allows for overdispersion in the distribution of all county out-migrant counts.[1] The negative binomial estimation used here models county-level structural characteristics as predictors of native out-migration. Along with several immigration measures, I also gauge the extent to which economic, socio-demographic, and geographic characteristics contribute to variations in out-migration across U.S. counties. These characteristics are summarized in Table 2 (see Appendix 1 for bivariate correlation coefficients).

Determinants of Native Out-Migration

Before introducing the theoretical variables of interest, two controls necessitated by the model and unit of analysis must be considered. First is a control for the *natural log of the native born population* in 1990, necessitated by the fact that the dependent variable is a simple, raw count of native out-migrants. This control should have a positive effect on native out-migration. Put simply, more natives can out-migrate if there are more natives present. A second control included is the *native-born inflow rate* between 1995 and 2000, which is a count of all native-born in-migrants normalized by the size of the labor force in 1990. This variable helps to isolate the effects of its counterpart gauging the effects of foreign-born

inflows, as both native- and foreign-born migrants may be attracted to the same places and characteristics, having a comparable effect on subsequent out-migration.

To gauge the effects of immigration on native out-migration, I measure the *foreign-born inflow rate* between 1995 and 2000, as well as the *foreign-born inflow rate squared*.[2] This rate includes a count of all foreign-born immigrants moving into a county, regardless of their time of entry into the U.S., normalized by the size of the 1990 labor force in the place of interest. This operationalization of the key variable of interest has a significant precedent in the immigration-migration literature (Wright, et al. 1997). White and Liang (1998) illustrate the importance of also accounting for the effects of pre-existing immigrant populations, noting that places with large immigrant populations may see less drastic migratory reactions to subsequent immigrant inflows. To control for the effects of pre-existent immigrant populations, I include the *percent foreign-born* in 1990. I also allow for non-linearity in this effect by including the *percent foreign-born squared* , noting that the nation's largest immigrant hubs may see different migratory reactions to their large immigrant populations than the rest of the nation. Following previous studies of the immigration-migration link, as the percent foreign-born in 1990 and the inflow of foreign-born between 1995 and 2000 increase, out-migration should increase. However, given evidence from Wright, et al. (1997), the effect of immigration on out-migration may be nullified as additional controls – particularly those gauging the economic climate – are introduced.

The above variables are included to capture the associations between immigration and native out-migration in a given county, but immigration to the potential destinations that natives can choose between may also influence whether they migrate or not. Destination effects on the propensity of natives to migrate have been a consideration in neighborhood mobility studies of late. Crowder, et al. (2011) find that immigration in surrounding tracts has a dampening effect on the probability that natives will leave their origin tract. Essentially, this suggests that when potential destinations are deemed less attractive by virtue of a significant immigrant presence, natives may forego migrating. The decreased desirability of potential destinations often has much to do with race, in addition to nativity. Crowder and South (2008)

find that Whites are less likely to move from their tract of residence if surrounding tracts have relatively large and growing minority populations. To test whether this phenomenon exists at the county level with respect to nativity, I include the *percent foreign-born in neighboring counties*. This variable represents the average percent foreign-born in all counties contiguous with the origin county and is expected to negatively affect native out-migration counts. I make two assumptions with this variable with respect to migrants' knowledge of the immigration characteristics of neighboring counties. First, I assume that migrants' knowledge of neighboring counties (whether accurate or not) encompasses only those immediately contiguous with their origin county. Second, I make the assumption that migrants' knowledge of dynamic immigration patterns in neighboring counties (again, whether accurate or not) is limited temporally. As such, I control for the size of the pre-existing immigrant population in neighboring counties, but do not assess the degree to which immigrant inflows influence native out-migrant counts.

A third group of covariates attempts to capture the important effects of the economic climate on native out-migration. Noting the importance of economic restructuring on migratory patterns (Wright, et al. 1997), it is necessary to separate these effects from those associated with immigration. Following Wright, et al. (1997), I control for the *employment growth* between 1990 and 2000. I also control for the *logged median household income*, *percent unemployed*, the *homeownership rate* in 1990, and the *median home costs* per month for both owner and renter households in 1990 in order to gauge the overall economic vitality of the county. The effect of these variables is somewhat difficult to predict. On one hand, economic vitality may induce individuals to migrate more readily, since the means to do so are available. On the other hand, as predicted by (dis)equilibrium models of migration, economic vitality may encourage individuals to stay put, particularly if they are invested in their communities via homeownership. Despite this uncertainty, however, these controls are included in order to better isolate the effects of immigration on out-migration.

A fourth set of demographic variables is also included to control for the differential propensities of native groups to migrate. Noting the importance of the life cycle on the propensity to migrate (Greenwood

1985) I include the *percent elderly* (age 65 and older) and the *percent of households with children*, with the assumption that as both of these populations increase, out-migration will decrease. Similarly, as the *percent with no High School diploma* increases, out-migration will likely decrease due to decreased resources among that demographic group.[3]

Finally, a fifth set of covariates is included to assess the effects of geography on out-migration, and are necessitated by the unit of analysis. Since counties are not uniform with respect to size or area, I include the *log land area* in square miles. Out-migration is only captured when natives cross a county border, so as land area increases it is less likely that a resident would cross a county border, thereby decreasing out-migration. Furthermore, I also include the *log intra-county moves*, a logged count of all moves within the county, to control for the underlying level of residential churning present. This helps separate the effects of immigration from those associated with general population turnover. A series of dummy variables capture other unmeasured sources of variation due to differences in *metropolitan* and *non-metropolitan* places, as well as differences in the propensity of natives to migrate across geographic regions (*South*, *Northeast*, *Midwest*, and *West*). In general, populations tend to flow from non-metro to metro counties, though "turn-arounds", "rural revitalizations", and exurbanization have worked to slow or reverse this trend (Greenwood 1985). It has also been shown that regions, sub-regions, and states, through processes of "spatial persistence" exert differential holding power on their citizens, affecting their propensity to migrate (Herting, Grusky, and Van Rompaey 1997: 268). Lastly, because any number of state policies and characteristics (not discussed here) may influence either immigration or migration, I model state fixed effects, allowing the baseline out-migration counts to vary by state.

Results of Negative Binomial Migration Count Models

Table 3 reports the coefficients of a negative binomial regression predicting the count of native out-migrants for each county in the contiguous U.S. Models 1 and 2 attempt to gauge the effects of immigration and other control variables, respectively and independent of one another. Model 3, the full model, gauges the effects of immigration on out-migration, controlling for economic, socio-demographic, and geographic characteristics. Each model includes the county population and native inflow rate to control for place size effects, and also includes fixed effects by state.

Model 1 is consistent with expectations and finds a significant link between immigration and native out-migration. Controlling for population size and turn-over, the positive coefficient for the percent foreign-born in 1990 ($b=3.97$; $p<0.001$) indicates that out-migration counts are greater in counties with larger immigrant populations. This positive effect is attenuated, however, in the places with the largest immigrant populations, as shown by the negative quadratic term associated with pre-existing foreign-born populations ($b=-0.09$; $p<0.001$). Similarly, there is evidence that places with larger immigrant inflow rates also experienced greater native out-migrant counts ($b=1.67$; $p<0.001$), but this effect is also attenuated in counties with the largest immigrant inflow rates (-0.05; $p<0.001$). While the coefficient for the percent foreign-born in surrounding counties is in the expected negative direction – suppressing native out-migration – it is not significant at $p<0.05$ ($b=-0.50$; $p<0.060$). One-tailed tests, however, allow the rejection of the null hypothesis that the effect is zero and support the conclusion that the effect is negative.

Model 2 predicts native out-migration counts as a function of economic, socio-demographic, and geographic variables without consideration for immigration effects. As is expected, employment growth and homeownership rates are negatively associated with native out-migration; controlling for all else, fewer natives leave when the local economy is growing and when they are invested in their communities via homeownership. Conversely, out-migration counts are higher in counties with higher unemployment rates and higher housing costs. Consistent with prior studies (see Greenwood 1985), out-migration is

lower in counties whose populations tend to be less mobile. As the percentage of the population age 65 and older, percent with no High School diploma, and percent with children increase, native out-migration counts decrease. Finally, while there are no significant differences between metropolitan and non-metropolitan counties, there is evidence that out-migration counts vary by region. As hinted at in Figure 1, the South has significantly lower numbers of native out-migrants than the West.

Model 3 includes both immigration and important control variables, allowing insight into the more isolated effects of immigration on out-migration. As predicted by prior studies of the immigration-migration link (i.e. Wright, et al. 1997), introducing controls for economic characteristics dampens the effects associated with immigration. Nonetheless, the pre-existing foreign-born population ($b=1.12$; $p<0.01$) and the immigrant inflow rate ($b=0.94$; $p<0.001$) are positively associated with native out-migration counts. The non-linearity associated with these immigration terms is also weakened by the inclusion of other controls. Furthermore, the negative effect of the percent foreign-born in neighboring counties is weakened by the introduction of other controls ($b=-0.29$, $p<0.14$). The failure to account for extra-local immigration effects, however, leads to the underestimation of the pre-existing immigrant effect in the origin (analysis not shown).[4] Consistent with neighborhood mobility studies, extra-local immigrant effects remain salient factors in migration at the county level.

The curvilinear effects of immigration indicators – the percent foreign-born in 1990 and the immigrant inflow rate from 1995 to 2000 – are plotted in Figure 2 and Figure 3, respectively. The range of values plotted for both variables are bounded by the minimum and maximum values actually observed in the sample of counties, but curves are faded for counties in the top percentile on either variable. Model 1, which includes no economic or socio-demographic controls, predicts large and widely varying effects for the pre-existing foreign-born population (Figure 2). The effect of the foreign-born population is increasingly positive for counties with up to 20 percent of their population foreign-born, decreasingly positive in counties with between 20 and 33 percent foreign-born, and negative for counties above 33 percent foreign-born. Uncertainty surrounding the size of the effects is increased at the tail of the

distribution of the percent foreign-born, as very few counties have such large immigrant populations. When all controls are introduced in Model 3, the effect of percent foreign-born becomes more linear, remains positive across all observed values of percent foreign-born, and exerts the largest effect in counties that are roughly 25 percent foreign-born. Similar effects are seen for immigration inflow rates (Figure 3). While Model 1 predicts that immigrant inflows will exert a negative influence on native out-migration when growing beyond 33 percent of the labor force in 1990, Model 3 predicts that immigration between 1995 and 2000 will positively affect native out-migration across all values observed. Taken together, these plots support the hypothesis that immigration exerts consistent positive pressure on native out-migration counts.

Predicting Distances Traveled by Native Out-Migrants

Part 1 of this analysis gauges, among other things, the effects of neighboring county immigration characteristics on the out-migration counts of an origin county. As shown and discussed above, the dampening effects of neighboring counties' immigration characteristics are not large or statistically significant in two-tailed tests. This lack of significance is somewhat surprising in light of a growing literature touting the salience of extra-local effects on migration. If natives are, in fact, responding to immigration when migrating, then extra-local immigration should influence native migration decisions. An alternative method of analyzing the effect of extra-local immigration effects is to examine the distance moved by native migrants as a function of extra-local characteristics.

This methodology is not unprecedented. In their study of neighborhood mobility and white flight, Crowder and South (2008) examine the effects of extra-local neighborhoods on the distances traveled by White migrants out of their origin tract. These authors find that, in addition to lowering the overall probability of White out-migration from the neighborhood of origin, when Whites do decide to relocate, they move farther when the closest potential destination neighborhoods have relatively large minority populations. I follow these authors' precedent and model the average distance migrated by natives from their origin county for each county in the U.S. using Ordinary Least Squares regression.

Census county-to-county migration files allow the calculation of the average distance traveled by native out-migrants between 1995 and 2000; this average serves as the dependent variable in the next analysis. For every county pair in the U.S., the migration file lists the number of migrants moving between that pair. When flows are especially low (fewer than 3 migrants), data are suppressed and not reported. Using an independent Stata package called "vincenty", I calculate the Haversine, or "Great Circle", distances between the centroids of each county pair[5]. I then weighted each distance by the size of the flow between those two counties and averaged them. As such, the average distance (in miles) traveled by native out-migrants is obtained for each county and is mapped in Figure 4.

Not surprisingly, the distance migrated by native out-migrants is greatest along the geographic boundaries of the nation – along the Pacific coast, the Mexican-American border, Florida, and New England. Also clear, however, is the vastly greater migration distance common to nearly all counties in the West. While these greater distances are largely a function of the larger land area of western counties, prior work has also noted that the West is exceptional in its lack of holding power exerted on residents (Herting, et al. 1997).

The determinants of the distance migrated are numerous and, to a large extent, unidentified. At the micro-level, studies have shown that while family and neighborhood characteristics often influence mobility between neighborhoods and within counties, long-distance and extra-county moves are influenced mostly by economic concerns (White and Lindstrom 2006). Macro-level effects on the distances migrated by migrants, however, are less documented. While Crowder and South (2008) have demonstrated the effects of neighborhood characteristics on migration distances, it is uncertain whether these phenomena will persist at the county level.

I make the assumption that the distance traveled by native migrants (having already made the decision to migrate across a county border) depends largely on the characteristics of areas beyond those of the origin county. These extra-local conditions are summarized above in column two of Table 2 (see Appendix 2 for bivariate correlation coefficients). I control for a number of socio-demographic and economic characteristics in neighboring counties, including: *total population (logged)*; *median household income (logged)*; *employment growth*; *percent unemployed*; *homeownership rate*; *median home costs*; *percent elderly*; *percent with no HS diploma*; and the *percent of households with children.* To determine the extent to which immigration in potential destinations affects native migratory decisions, I again rely on the *percent foreign-born in neighboring counties* in 1990. Increased immigration to the closest potential destinations should act to *increase* the distance migrated by those who choose to leave the origin county. In essence, high immigration in potential destinations serves as a hurdle to native migrants, over which they must jump in order to find a suitable destination. As in the above analysis of out-migrant counts, I

make the assumption that the distance traveled by migrants, to the extent that it is influenced by immigration in neighboring counties, is dependent on pre-existing immigrant populations rather than dynamic immigrant inflow patterns.

Some characteristics of origin counties that push natives to migrate in the first place may also influence the distance out-migrants travel when migrating. Economic and demographic characteristics of contiguous counties are similar and highly correlated. This creates problems when modeling, as it is difficult to disentangle the effects of origin and neighboring county characteristics on the distance migrated. For this reason, I minimize the demographic and economic characteristics controlled in the county of origin to only indicators of population and immigration. I include demographic controls for the *total population (logged)* and the *percent foreign-born* in 1990 in the origin county. Because counties differ greatly in size across the U.S., I also control for the *land area* and the *log intra-county moves* in the county of origin. A series of dummy variables capture other unmeasured sources of variation due to differences in *metropolitan* and *non-metropolitan* places, as well as differences in the distances traveled by natives across geographic regions (*South*, *Northeast*, *Midwest*, and *West*). Lastly, because any number of state policies and characteristics may influence either immigration or migration, I model state fixed effects, allowing the baseline distances migrated to vary by state.

Results of OLS Models of Distances Migrated by Native Out-Migrants

Table 4 presents the coefficients of an OLS State Fixed Effects model of the average distance moved by native out-migrants for each county in the contiguous U.S. Model 1 gauges the effect of pre-existing foreign born populations in neighboring counties on migration distance. Controlling for the logged population in neighboring counties and the state in which the origin county is located, for each one percent increase in the foreign born population in neighboring counties, natives can be expected to travel – on average – an additional 8.07 miles ($p<0.001$). This effect is cut nearly in half, however, when origin county demographic and geographic controls are introduced in Model 2 ($b=4.16$, $p<0.001$).

Immigration in neighboring counties is correlated with many other characteristics which may bias the neighboring immigration coefficients obtained in Model 2. As such, Model 3 adds indicators of economic well-being, as well as a number of socio-demographic measures. Controlling for these factors in addition to those of the origin county, the effect of a one percent increase in the foreign-born in neighboring counties increases the average distance migrated by native out-migrants by 5.89 miles ($p<0.001$).Standardized beta coefficients are also offered in Table 4 so that the relative influence of immigration in neighboring counties may be gauged. Relative to the percent foreign-born, other neighboring county characteristics – such as the percent unemployed, the percent homeowner, the percent elderly, and the percent of households with children – and origin county characteristics – such as the total population, the percent foreign-born, the county size, and metropolitan status – exert weak positive effects on the average distance migrated. Median home costs in neighboring counties and intra-county moves in the origin, however, exert greater positive influences on distance migrated than the percent foreign born in neighboring counties. A number of neighboring county characteristics negatively influence the distance moved by native out-migrants, presumably by increasing the attractiveness of nearby destinations. Migration distance is shortened as the total population, median household income, employment growth, and percent with no High School diploma increase in neighboring counties. Consistent with prior studies of geographic structuration which find that the West exerts little "holding power" on its residents

(Herting, et al. 1997), Model 3 shows that the Midwest, South, and Northeast all exhibit shorter average distances traveled by their native out-migrants. In short, however, immigrant presences in neighboring counties have a relatively strong influence on the distance migrated by natives crossing a county border.

Discussion and Conclusions

The analyses above attempt to gauge the effect of immigration on native migratory patterns with the expectation that natives will tend to leave those places in greater numbers which also attract relatively large numbers of immigrants. To a large extent, this expectation is confirmed – native out-migrant counts increase with larger pre-existing foreign-born populations and with larger immigrant inflow rates. Frey's (e.g. 1996) description of macro-level "balkanization" trends is consistent with these more contemporary 1995-2000 results, as are numerous micro-level metropolitan (Filer 1992; White and Liang 1998) and neighborhood level analyses (e.g. Crowder, et al. 2011). The findings presented here, however, are slightly at odds with other studies which carefully broke net native migration into their constituent in- and out-migration components. White and Imai (1994) and Card (1997), rather than finding a significant positive relationship between immigration and native out-migration, find that immigration generally influences native in-migration, instead. Setting aside, however, the varying geographies and time periods represented, the results presented here may differ from those of White and Imai (1994) and Card (1997) because the present study effectively controls for the dampening effects of neighboring counties' immigration profiles.

Consistent with prior work (e.g. Wright, et al. 1997) and with expectations, controlling for economic and socio-demographic characteristics tempered immigration effects on native out-migration. The positive effects of immigration remain robust, however, to these controls. It is apparent that the effects of immigration on native out-migrant counts are non-linear; immigration (whether in the form of pre-existing foreign-born populations or new immigrants) tends to have a relatively smaller effect at relatively small or large values. Substantively, this means that counties with very small foreign-born populations or experiencing little growth in the size of the foreign-born population saw relatively low native out-migrant counts; there was too little change to make a difference. The same is true of counties with relatively large foreign-born populations and large immigrant inflows; natives in these counties may be accustomed to immigrant populations and relatively unaffected by immigration dynamics.

The analysis of distance migrated by native out-migrants moving to another county further implicates immigration in native migration decisions. Increased immigration to counties surrounding the county of origin not only tempers out-migration counts, but also creates a hurdle for natives who do choose to migrate. Native out-migrants travel farther when the foreign-born presence in neighboring counties is greater. This phenomenon is consistent with Crowder, et al.'s (2011) report of extra-local immigrant effects at the neighborhood level, as well as with Crowder and South's (2008) finding that the distance moved by whites at the neighborhood level depends, in part, on the minority profile of surrounding neighborhoods.

Limitations inherent in model design necessitate caution when interpreting the real-world implications of these results. First, because the data used here are aggregated at the county level, inferences regarding causation cannot reliably be made. This analysis uncovers a robust association between immigration and native out-migration in U.S. counties, net of other confounding effects, but the conclusion that immigration *causes* native out-migration cannot be drawn from this analysis alone. Second, this analysis examines out-migration only and does not account for the often counter-balancing effects of in-migration. To the extent that native in-migrants replace out-migrants, the association between immigration and native migration may be overstated in this analysis. Third, this analysis is limited in temporal scope. While explanatory variables are lagged to more accurately model causal processes, the five-year period over which migration is measured in this analysis limits general conclusions about the relationship between immigration and migration.

Subsequent research could build upon this analysis in several ways. First, an analysis of native in-migration and the effects of immigration would help round out the story started here. Second, this analysis could easily be extended to include prior time periods. In this way, the likely dynamic relationship between immigration and native migration could be gauged over time. Third, to the extent that data allows, county-level data could be modeled hierarchically in conjunction with individual level data, allowing the interplay between individual and structural factors to be elucidated. Finally, though

implicit in this analysis, the link between emerging "new" immigrant destinations and native out-migration could be explicitly explored. These avenues might allow us to better understand native responses to dynamic immigration patterns in the U.S.

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1 Overdispersion is present in the observed out-migration counts (i.e., the variance is greater than the mean out-migrant count). In all models presented the overdispersion parameter, α, is statistically significant, indicating that the negative binomial estimator is preferred over the Poisson.

2 The foreign born inflow includes moves originating domestically and from abroad. It may be argued that, due to processes of assimilation, foreign born inflows from abroad may have a larger effect on native out-migration (Card 2001:24-25). The models below are robust to changes in the specification of this key variable, however.

[3] Frey, et al.'s (1996) finding that less-skilled, less-educated workers might be disproportionately sensitive to immigration implies an interaction effect between the percent with no High School diploma and immigrant inflow rates. I tested this interaction in the models reported below, but found no significant interaction effects between high-school dropout rates and immigration. These results are not reported in the final models for the sake of parsimony.

[4] When extra-local immigration effects are not modeled, the coefficient for the *percent foreign-born in 1990* shrinks in both magnitude and significance, from 1.12 ($p<0.01$) to 0.90 ($p<0.05$).

[5]This formula accounts for the curve of the Earth's surface when determining distances between two coordinate points and assumes a spherical Earth. While the Earth is actually ellipsoidal, the distances calculated are not biased to any appreciable extent by the spherical assumption. Calculating the distances between county centroids involves the assumption that, on average, the distances traveled between two counties by migrants will approximate the distance between geographic centroids. A more defensible

distance calculation might calculate distances between county population centers, but this would also entail problematic assumptions.

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Tables

Table 1: Immigration and Foreign-Born Population Growth by County Metropolitan Status and Pre-existing Foreign-Born Population, 1995-2000

		Percent of Total in:				
	Total	Metro Counties	Non-Metro Counties	Low Percent Foreign-Born	Average Percent Foreign-Born	High Percent Foreign-Born
Foreign-Born, From Abroad	5,589,976	95.0	5.0	2.6	26.0	71.4
Foreign-Born, Domestic	4,059,734	92.8	7.2	3.9	32.7	63.4
All Foreign-Born	9,649,710	94.1	5.9	3.2	28.8	68.0
Growth in Foreign-Born, 1990 -2000	95.1%	84.7%	142.6%	207.3%	87.2%	62.2%
Counties in Category	3,074	1,062	2,012	1,503	1,347	224

Source: Author tabulations of 2000 US Bureau of Census SF1 and County Migration Files. "Low Percent Foreign-Born" Counties are those with less than 1% Foreign-Born in 1990. "High Percent Foreign-Born" Counties are those with 6% or more of their total population Foreign-Born in 1990. "Average Percent Foreign-Born" Counties are those with more than 1% but less than 6% Foreign-Born in 1990. Metro Status is determined according to 2000 Census definitions.

Table 2: Summary Statistics for All Modeled Variables

Variable	Mean	Std. Dev.	Variable	Mean	Std. Dev.
DEPENDENT VARIABLES			NEIGHBORING COUNTY CHARACTERISTICS		
Native Out-Migration Count, '95-'00	13,920.56	36,391.13	Total Population (logged)	12.87	1.30
Average Distance Migrated, '95-'00	272.58	127.14	Percent Foreign-Born	2.72	3.68
			Median HH Income (logged)	10.11	0.21
ORIGIN COUNTY CHARACTERISTICS			Employment Growth, '90-'00	13.18	12.99
Immigration			Percent Unemployed	5.89	2.07
Percent Foreign-Born	2.21	3.59	Homeownership Rate	69.80	5.93
Foreign-Born Inflow Rate, '95-'00	3.33	4.17	Median Home Costs	3.96	1.15
			Percent Elderly	13.87	3.19
Economy			Percent w/ No HS Diploma	28.01	8.37
Median HH Income (logged)	10.04	0.25	Percent of HHs w/ Children	37.18	4.07
Employment Growth, '90-'00	13.87	17.17			
Percent Unemployed	6.12	2.91	GEOGRAPHY		
Homeownership Rate	72.75	7.51	Land Area (1,000s of mi^2)	0.96	1.31
Median Home Costs ($100s)	3.61	1.27	Intra-County Moves (logged)	-0.71	1.56
			Metropolitan	0.35	--
Socio-Demographic			Non-Metropolitan	0.65	--
Native Population (logged)	10.12	1.36	South	0.45	--
Native Inflow Rate, '95-'00	44.28	20.20	Northeast	0.07	--
Percent Elderly	14.96	4.33	Midwest	0.34	--
Percent w/ No HS Diploma	30.46	10.34	West	0.13	--
Percent of HHs w/ Children	37.24	5.44	N	3,074	

All variables, unless otherwise noted, are measured in 1990. Migration counts, rates, and distances are calculated from the 2000 U.S. Census Migration File and represent immigration and migration between counties from 1995 to 2000. Unemployment estimates are drawn from the Bureau of Labor Statistics. All other variables are drawn from the 1990 (and, in the case of employment growth, the 2000) U.S. Census SF1 and SF3. Neighboring county characteristics represent the average characteristics of all counties contiguous with the origin county of interest.

Table 3: Negative Binomial Regression Coefficients Predicting Native Out-Migration Counts, 1995-2000

Native Outflow Count	Model 1		Model 2		Model 3	
Native Population, 1990 (logged)	0.98 (0.01)	***	0.93 (0.03)	***	0.91 (0.03)	***
Native-Born Inflow Rate, '95-'00 §	0.63 (0.03)	***	0.50 (0.05)	***	0.51 (0.05)	***
IMMIGRATION						
Percent Foreign-Born, 1990 §	3.97 (0.62)	***	--		1.12 (0.38)	**
Percent Foreign-Born (squared) §	-0.09 (0.01)	***	--		-0.02 (0.01)	*
Foreign-Born Inflow Rate, '95-'00 §	1.67 (0.34)	***	--		0.94 (0.27)	***
Foreign-Born Inflow Rate (squared)§	-0.05 (0.01)	***	--		-0.02 (0.01)	*
Percent Foreign-Born in Neighboring Counties §	-0.50 (0.26)		--		-0.29 (0.19)	
ECONOMY						
Median HH Income (logged) §	--		-3.17 (3.94)		-5.13 (3.91)	
Employment Growth (1990-2000) §	--		-0.15 (0.05)	**	-0.19 (0.05)	***
Percent Unemployed §	--		0.76 (0.20)	***	0.74 (0.20)	***
Percent Owner HHs §	--		-1.01 (0.08)	***	-0.81 (0.08)	***
Median Home Costs ($100s) §	--		7.48 (0.83)	***	6.27 (0.88)	***
SOCIO-DEMOGRAPHIC						
Percent Elderly §	--		-0.81 (0.19)	***	-0.82 (0.19)	***
Percent w/ No HS Diploma §	--		-0.96 (0.09)	***	-1.07 (0.09)	***
Percent HHs w/ Children §	--		-0.30 (0.15)	*	-0.26 (0.14)	
GEOGRAPHY						
County Land Area (1,000s of mi^2)§	--		0.89 (0.28)	**	0.92 (0.29)	***
Intra-County Moves (logged) §	--		-2.80 (2.49)		-0.81 (2.56)	
Metropolitan §	--		0.80 (0.86)		1.39 (0.87)	
South	--		-0.14 (0.04)	**	0.13 (0.04)	**
Northeast	--		0.12 (0.14)		0.11 (0.15)	
Midwest	--		-0.05 (0.04)		-0.03 (0.04)	
Constant	-1.51 (0.06)	***	0.10 (0.47)		0.43 (0.48)	
Log-Likelihood	-25,392		-24,779		-24,747	
BIC	51,234		50,063		50,040	
n = 3,074						

Robust Standard Errors are in parentheses. All variables are measured in 1990 unless otherwise noted. Though not reported, state fixed effects are included in all models and significantly improve model fit. Migration rates are normalized by the county labor force in 1990. All models were examined for influential cases and outliers that may bias results. Though extremely influential cases exist, they did not alter substantive conclusions and were left in the analysis. *p<0.05; **p<0.01; ***p<0.001

§ Coefficients and Standard Errors are multiplied by 100.

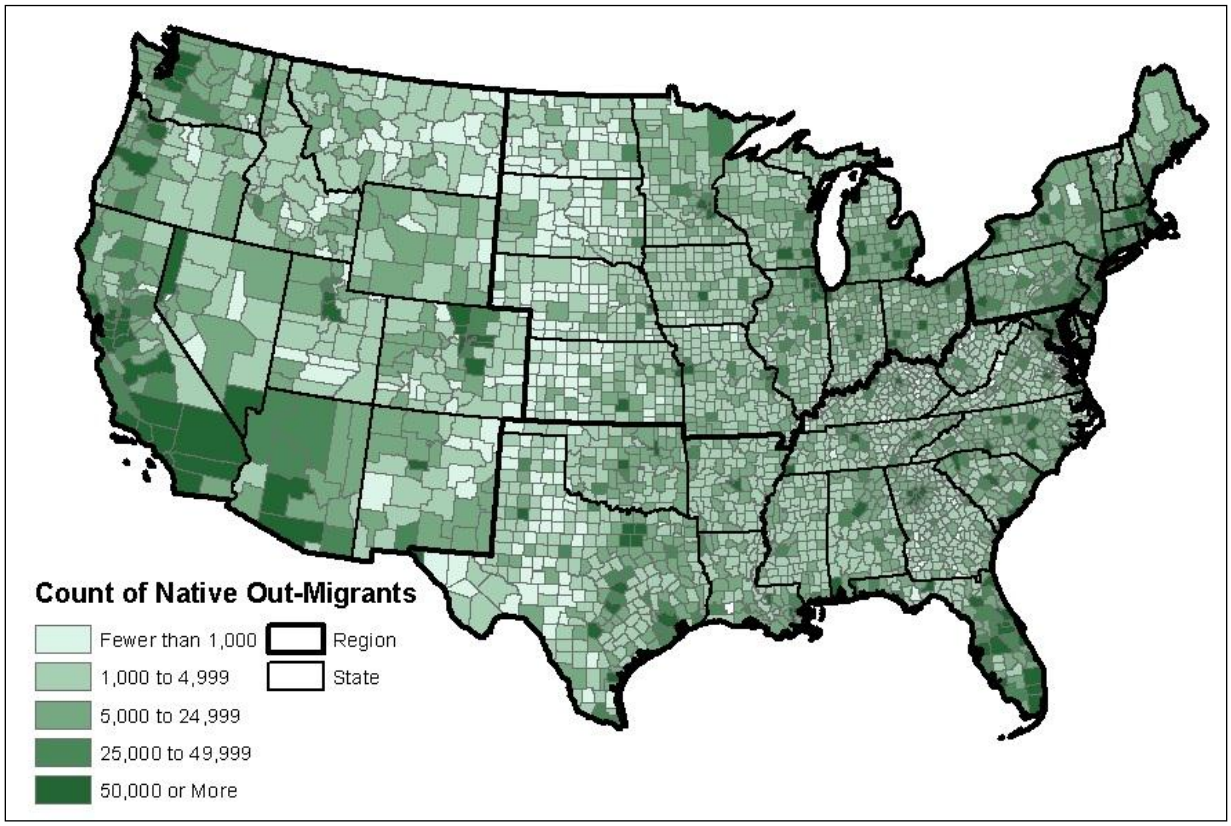
Table 4: OLS Regression Coefficients Predicting the Average Distance Migrated by Native Out-Migrants, 1995-2000

Distance Migrated (miles), 1995-2000	Model 1		Model 2		Model 3		Standard Betas
NEIGHBOR CHARACTERISTICS							
Total Population (logged)	-1.21 (1.66)		0.65 (2.64)		-19.43 (2.32)	***	-0.20
Percent Foreign-Born	8.07 (0.68)	***	9.05 (0.85)	***	5.89 (0.82)	***	0.17
Median HH Income (logged)	--		-179.97 (31.92)	***	-232.81 (26.56)	***	-0.38
Employment Growth	--		-0.32 (0.17)		-0.51 (0.13)	***	-0.05
Percent Unemployed	--		1.98 (1.59)		1.99 (1.28)		0.03
Percent Owner HHs	--		3.26 (0.57)	***	2.12 (0.47)	***	0.10
Median Home Costs	--		34.53 (5.55)	***	23.89 (4.64)	***	0.22
Percent Elderly	--		4.43 (1.46)	**	3.48 (1.21)	**	0.09
Percent w/ No HS Diploma	--		-4.24 (0.59)	***	-5.95 (0.49)	***	-0.39
Percent HHs w/ Children	--		3.69 (0.99)	***	3.76 (0.82)	***	0.12
ORIGIN CHARACTERISTICS							
Total Population (logged)	--		--		3.62 (9.31)		0.04
Percent Foreign-Born	--		--		4.01 (0.67)	***	0.11
County Land Area	--		--		0.07 (0.02)	***	0.08
Intra-County Moves, 1995-2000 (logged)	--		--		35.91 (7.76)	***	0.44
Metropolitan	--		--		10.35 (3.87)	**	0.04
Non-Metropolitan (Ref.)	--		--		--		--
South	--		--		-141.98 (70.18)	*	-0.56
Northeast	--		--		-110.98 (44.07)	*	-0.23
Midwest	--		--		-219.70 (56.37)	*	-0.82
West (Ref.)	--		--		--		--
Constant	389.77 (57.56)	***	1722.47 (304.27)	***	2774.58 (276.8)	***	--
Adjusted R-squared	0.4783		0.5003		0.6587		--
BIC	36,870		36,794		35,664		--
n = 3,074							

Robust Standard Errors are listed in parentheses. All variables are measured in 1990 unless otherwise noted. Though not reported, state fixed effects are included in all models and significantly improve model fit. All models were examined for influential cases and outliers that may bias results. Though extremely influential cases exist, they did not alter substantive conclusions and were left in the analysis.
*p<0.05; **p<0.01; ***p<0.001

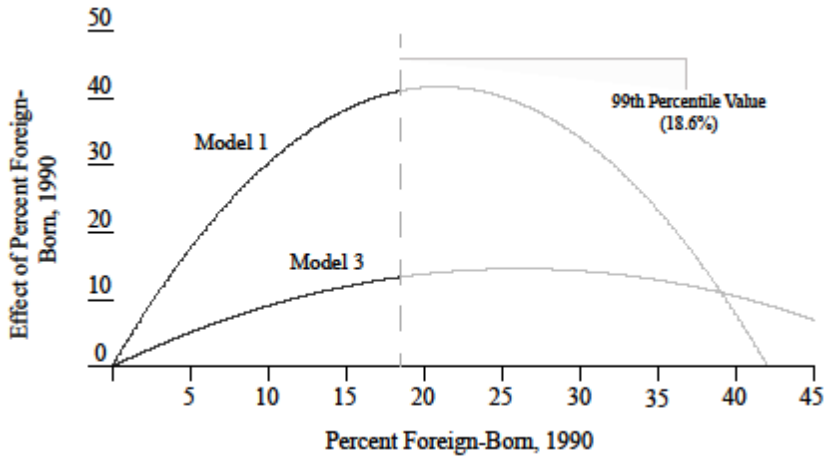
Figures

Figure 1: Native Out-Migrant Counts for the Contiguous U.S., 1995-2000



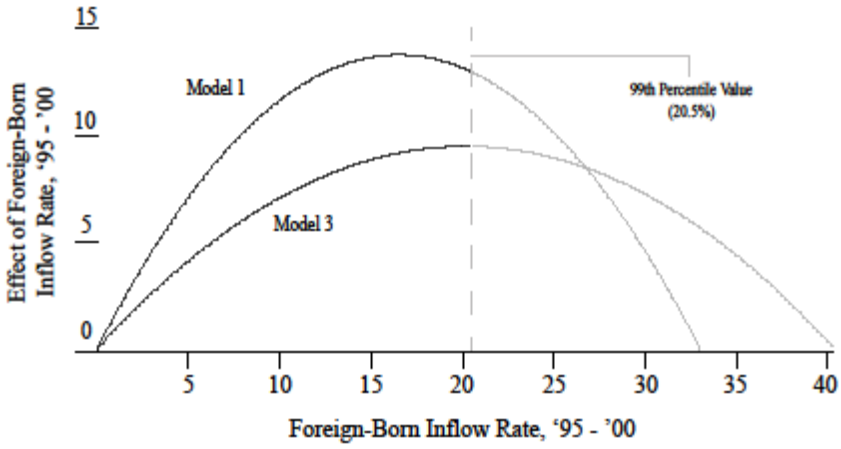
County native out-migrant counts are estimated by the 2000 U.S. Census Migration Files and describe migration occurring between 1995 and 2000. County, State, and Regional boundaries as mapped are consistent with 2000 Census borders.

Figure 2: Non-Linear Effect of Percent Foreign-Born in 1990 on Native Out-Migration Counts, 1995-2000



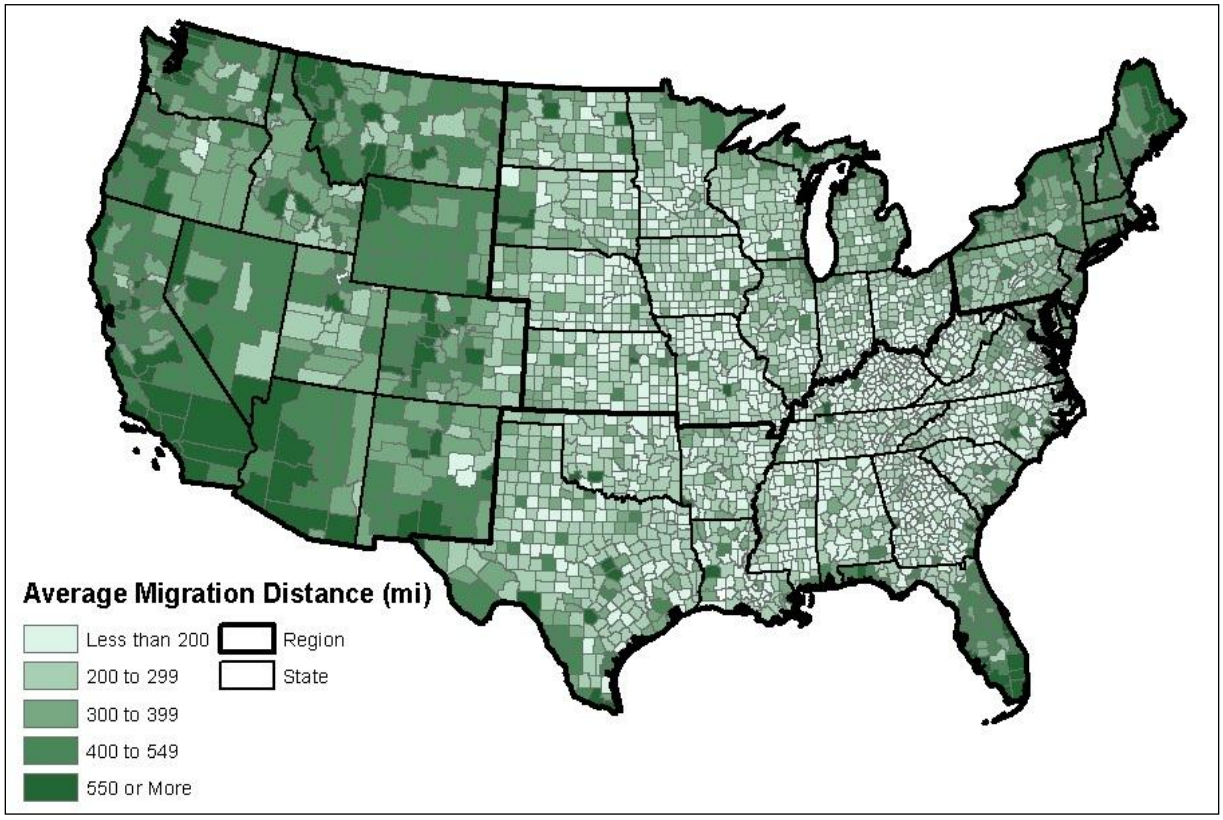
See Table 3 for a full account of Models 1 and 3. Expected coefficients are plotted across observed values of percent foreign-born in 1990 and range from 0.0 (Carlisle County, KY, among others) to 45.0 percent (Miami-Dade County, FL). This distribution, however, is skewed heavily in the positive direction with only a few counties having 1990 Foreign-Born populations greater than 19 percent.

Figure 3: Non-Linear Effect of Immigration Inflows on Native Out-Migration Counts, 1995-2000



See Table 3 for a full account of Models 1 and 3. Expected coefficients are plotted across observed values of immigrant inflow rates between 1995 and 2000 and range from 0.0 (Carlisle County, KY, for example) to 40 percent (Presidio County, TX). This range, however, is skewed heavily in the positive direction with only a few counties having immigrant inflow rates greater than 20 percent between 1995 and 2000.

Figure 4: Average Distance Migrated by Native Out-Migrants, 1995-2000



The average distance migrated by native out-migrants for each county are derived from the 2000 U.S. Census Migration Files and describe migration occurring between 1995 and 2000. Distances represent the average centroid-to-centroid distances between origin and destination county pairs in miles. County, State, and Regional boundaries as mapped are consistent with 2000 Census borders.

Appendix 1: Bivariate Correlation Matrix for Negative Binomial Models of Native Out-migrant Counts, 1995-2000

	Native Out-Migrant Count	Native Pop.	Native Inflow Rate	% Foreign Born	Foreign Born Inflow Rate	% Foreign Born (Neighboring)	Median HH Inc. (logged)	Employment Growth	% Unemployed	Ownership Rate	Median Home Cost	% Elderly
Native Pop.	**0.63**	1.00										
Native Inflow Rate	-0.11	-0.13	1.00									
% Foreign Born	**0.50**	0.34	-0.04	1.00								
Foreign Born Inflow Rate	0.39	0.33	0.21	0.67	1.00							
% Foreign Born (Neighboring)	0.41	0.30	0.04	0.78	0.56	1.00						
Median HH Inc. (logged)	0.38	0.55	0.06	0.28	0.32	0.34	1.00					
Employment Growth	-0.03	0.06	0.71	-0.03	0.28	0.05	0.17	1.00				
% Unemployed	-0.07	0.05	-0.05	0.09	-0.04	0.03	-0.40	0.06	1.00			
Ownership Rate	-0.42	-0.38	0.04	-0.46	-0.40	-0.31	-0.16	0.19	0.06	1.00		
Median Home Cost	**0.52**	0.68	0.14	0.44	0.46	0.49	0.85	0.24	-0.22	-0.32	1.00	
% Elderly	-0.24	-0.42	-0.11	-0.22	-0.28	-0.19	-0.43	-0.18	-0.10	0.34	-0.52	1.00
% No HS Diploma	-0.24	-0.27	-0.15	-0.13	-0.17	-0.15	-0.68	-0.13	0.46	0.28	-0.55	0.13
% HH w/ Children	-0.06	0.07	-0.01	0.07	0.06	0.07	0.02	0.08	0.28	0.00	0.08	-0.71
Land Area	0.08	-0.01	0.12	0.20	0.14	0.24	0.00	0.05	0.05	-0.15	0.03	-0.10
Intra-county Moves (logged)	**0.60**	0.99	-0.11	0.32	0.33	0.28	0.52	0.11	0.07	-0.39	0.66	-0.42
Metropolitan	0.38	0.57	0.12	0.21	0.24	0.24	0.53	0.21	-0.12	-0.19	0.56	-0.41
South	-0.06	0.01	0.09	-0.07	0.04	-0.06	-0.27	0.00	0.16	0.10	-0.14	-0.13
Northeast	0.14	0.29	-0.19	0.18	0.03	0.19	0.28	-0.13	-0.04	-0.10	0.33	-0.06
Midwest	-0.08	-0.13	-0.18	-0.21	-0.24	-0.22	0.06	-0.08	-0.19	0.11	-0.14	0.27

	% No HS Diploma	% HH w/ Children	Land Area	Intra-County Moves	Metropolitan	South	Northeast
% HH w/ Children	0.25	1.00					
Land Area	-0.16	0.09	1.00				
Intra-County Moves	-0.25	0.08	0.01	1.00			
Metropolitan	-0.26	0.15	-0.08	0.54	1.00		
South	0.61	0.24	-0.23	0.02	0.07	1.00	
Northeast	-0.18	-0.11	-0.04	0.25	0.13	-0.25	1.00
Midwest	-0.32	-0.21	-0.14	-0.14	-0.11	-0.66	-0.20

Note: Correlations between the dependent variable (Native Out-migrant Count) and covariates of 0.50 or greater are **emboldened**. Native Out-migrant Count is measured between 1995 and 2000. Native and Foreign Born Inflow Rates represent in-migrant counts normalized by the size of the 1990 labor force. Employment growth is measured between 1990 and 2000. All other variables are measured in 1990 and are drawn from the US Census or BLS.

Appendix 2: Bivariate Correlation Matrix for OLS Models of Distance Migrated by Native Out-migrants, 1995-2000

		NEIGHBORING COUNTIES									
	Avg. Distance Migrated	Population (logged)	% Foreign Born	Median HH Inc. (logged)	Employment Growth	% Unemployed	Ownership Rate	Median Home Costs	% Elderly	% No HS Diploma	% HH w/ Children
NEIGHBORING COUNTIES											
Population (logged)	0.20	1.00									
% Foreign Born	0.45	0.47	1.00								
Median HH Inc. (logged)	0.27	0.66	0.37	1.00							
Employment Growth	0.11	-0.01	0.00	0.10	1.00						
% Unemployed	0.03	-0.05	0.13	-0.44	0.07	1.00					
Ownership Rate	-0.23	-0.56	-0.54	-0.33	0.14	0.17	1.00				
Median Home Cost	0.38	0.72	0.58	0.89	0.12	-0.26	-0.49	1.00			
% Elderly	-0.12	-0.51	-0.27	-0.46	-0.17	-0.04	0.44	-0.54	1.00		
% No HS Diploma	-0.34	-0.34	-0.13	-0.68	-0.12	0.55	0.33	-0.54	0.15	1.00	
% HH w/ Children	-0.03	-0.03	0.09	-0.11	0.11	0.34	0.03	-0.03	-0.64	0.34	1.00
ORIGIN COUNTY											
Population (logged)	0.42	0.61	0.32	0.48	-0.02	0.03	-0.19	0.53	-0.27	-0.14	-0.04
% Foreign Born	0.49	0.32	0.78	0.29	0.01	0.10	-0.37	0.44	-0.16	-0.11	0.05
Land Area	0.41	0.05	0.24	0.01	0.19	0.06	-0.16	0.08	-0.10	-0.17	0.10
Intra-county Moves	0.41	0.58	0.28	0.45	0.02	0.05	-0.17	0.49	-0.27	-0.12	-0.03
Metropolitan	0.20	0.55	0.24	0.48	-0.01	-0.13	-0.31	0.49	-0.33	-0.22	-0.01
South	-0.29	0.01	-0.07	-0.27	-0.03	0.21	0.06	-0.14	-0.15	0.63	0.30
Northeast	0.22	0.24	0.19	0.30	-0.21	-0.04	-0.10	0.33	-0.01	-0.16	-0.17
Midwest	-0.18	-0.18	-0.22	0.03	-0.08	-0.23	0.18	-0.19	0.31	-0.33	-0.28

	ORIGIN COUNTY						
	Population (logged)	% Foreign Born	Land Area	Intra-county Moves	Metropolitan	South	Northeast
% Foreign Born	0.37	1.00					
Land Area	-0.00	0.20	1.00				
Intra-county Moves	0.99	0.32	0.01	1.00			
Metropolitan	0.57	0.21	-0.08	0.54	1.00		
South	0.01	-0.07	-0.23	0.02	0.07	1.00	
Northeast	0.29	0.18	-0.04	0.25	0.13	-0.25	1.00
Midwest	-0.13	-0.21	-0.14	-0.14	-0.12	-0.66	-0.20

Note: Origin County characteristics are measured in single counties from which native migration originates. Neighboring County characteristics are the average measures of counties contiguous with the origin county. The dependent variable (average distance migrated) is the average distance migrated by natives in 1995-2000 between origin and destination county centroids. Employment growth is measured between 1990 and 2000. All other variables are measured in 1990 and are drawn from the US Census or BLS.