Immigration, Internal Migration, and Local Labor Market Adjustment During the Great Recession*

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Abstract

This paper demonstrates that low-skilled Mexican-born workers’ location choices in the U.S. respond strongly to changes in local labor demand, and that this geographic elasticity helps equalize spatial differences in labor market outcomes for low-skilled native workers, who are much less elastic. We utilize geographic variation in the severity of the Great Recession to measure local demand conditions, and confirm the standard finding that high-skilled natives are quite responsive to employment opportunities while low-skilled natives are not. Low-skilled immigrants however, primarily those from Mexico, respond even more strongly than do high-skilled workers. These results are robust to a wide variety of controls, a pre-recession falsification test, and to instrumenting for local labor demand using pre-recession household leverage. Natives living in cities with substantial Mexican-born population are insulated from the effects of local labor demand shocks compared to those in cities with few Mexicans, and a counterfactual setting without equalizing Mexican mobility would exhibit a much stronger relationship between local shocks and local employment outcomes.

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1 Introduction

The recession that began in December 2007 and ended in June 2009, now commonly referred to as the Great Recession, represented the largest decline in GDP since World War II. Total employment fell by more than eight million jobs, and unemployment rose by more than five percentage points. There was, however, substantial variation in the severity of the recession across geography, with some local labor markets even expanding over this time period. These differences created large incentives for workers to relocate in order to find more favorable labor demand conditions. A well developed literature has shown that in such circumstances highly skilled workers respond by moving away from the most negatively affected labor markets to more favorable markets, while less-skilled workers are much less likely to respond. This differential mobility has led to concerns that local labor market shocks tend to be much more persistent among low-skilled workers (Bound and Holzer 2000).

This paper confirms the prior literature’s findings for natives but demonstrates a previously overlooked aspect of the phenomenon: in sharp contrast to less skilled natives, less skilled immigrants respond quite strongly to geographic differences in labor demand shocks. This novel finding reveals that immigrants with at most a high school degree, particularly those from Mexico who are most likely to be unauthorized (Passel 2005), have geographic labor supply elasticities even greater than those of college educated natives. Moreover, we find strong evidence that this high degree of mobility among less skilled Mexican-born workers helped equalize labor market outcomes faced by less mobile native workers. Natives living in cities with substantial Mexican-born population are insulated from the effects of local labor demand shocks compared to those in cities with few Mexicans to arbitrage away local

1 The literature considering migration in response to differences in expected earnings began with Sjaastad (1962). Blanchard and Katz (1992) provide evidence that this mechanism helps smooth regional shocks.

2 Higher migration rates among college educated workers have been documented in numerous studies, including Greenwood (1975) and Greenwood (1997). Wozniak (2010) finds that the college educated are more likely to make long-distance moves in response to changes in demand.
shocks. We show that, across all cities, a counterfactual setting without equalizing Mexican
mobility would exhibit a much stronger relationship between local shocks and local labor
market outcomes.

Our empirical strategy relies on the substantial variation across cities in the depth of
the recession. Employment changes ranged from losses of 15-18 percent in the hardest hit
cities to weak growth among cities that were relatively less affected. We further exploit two
important features of the Great Recession that allow us to directly measure labor demand
declines across cities: wages were downward rigid and labor demand declined in nearly
all cities. These two features allow us to directly observe inward shifts in labor demand
based on changes in the quantity of employment. For our main specifications, we construct
measures of employment declines that are specifically tailored to the industrial composition
of each demographic group in each city prior to the recession. This adjustment ensures that
any differences in elasticities that we observe across groups is not driven by their different
industrial composition.

We rule out a wide variety of alternative explanations for the observed differences in
geographic elasticities between less skilled native-born and Mexican-born individuals. We
include controls accounting for immigrants’ potential diffusion away from traditional gateway
cities (Card and Lewis 2007) and controls for new state-level legislation directed at unau-
thorized immigrants. These controls explain some of the variation in population growth,
but our primary finding is robust to their inclusion. We also consider the possibility that
the shift toward cities with more mild recessions was part of an ongoing trend among the
Mexican-born, and we find that, if anything, this shift represents a reversal of pre-recession
trends.

Another potential concern is reverse-causality, in which shifts in workers’ location choices

\(^3\)Bohn and Santillano (2012) collected a comprehensive list of these laws during the time period covered
by our study and were kind enough to share their database with us for this project.
cause changes in employment either mechanically by reducing the labor force or through a decline in local product demand. First, we note that such a concern would apply to both natives and Mexicans. In fact, we would expect a *smaller* observed elasticity for Mexicans, who remit a substantial share of earnings and whose departure would thus have a smaller effect on local product demand. The data do not reflect this pattern. Second, we calculate instrumental variables estimates using household leverage prior to the recession as an instrument for local employment declines. Mian and Sufi (2012) demonstrate that leverage reliably predicts differences in the severity of a local downturn during this time period, and pre-shock leverage is plausibly exogenous to other determinants of Mexicans’ location choices. The striking gap in geographic supply response between low-skilled Mexican-born and native-born workers remains.

These results establish that low skilled Mexican-born workers are in fact more geographically responsive than are similarly skilled natives. A remaining question is why the two groups respond so differently. We use a propensity score reweighting strategy to determine whether the differential elasticities are explained by these different observable characteristics such as age, marital status, detailed educational attainment, and home ownership. Even when weighted to match the observed characteristics of Mexican workers, natives exhibit no discernable response to local labor demand shocks. A remaining possibility is that Mexican-born workers are on average more connected to the labor force, either due to lack of eligibility for unemployment and other benefits or because they act as target earners for whom extended spells of unemployment would be particularly costly (Massey, Durand and Malone 2003). Supporting these ideas, less skilled Mexican-born workers consistently exhibit lower rates of unemployment insurance receipt and shorter unemployment spells than similarly skilled natives. Finally, we show that roughly 20 percent of the observed Mexican reallocation occurred through relatively larger inflows from abroad into cities with milder employment declines - an adjustment channel unavailable to natives.
Having established that less-skilled Mexican-born workers leave labor markets experiencing larger declines in labor demand in favor of markets facing smaller declines, we turn to investigating the implications of this behavior for the labor market outcomes of less responsive native workers. Intuitively, mobile immigrants decrease labor market competition in the most negatively affected markets and increase competition in stronger markets, partly equalizing outcomes across geography, even for workers that do no migrate. Empirically, cities with substantial Mexican-born population share exhibit a markedly weaker relationship between changes in native employment outcomes and local demand shocks than cities with a smaller Mexican presence. This result demonstrates that Mexican mobility arbitrages away some of the differences in outcomes that natives otherwise would have faced. To get a sense for the overall quantitative impact of this equalizing effect of immigrant mobility, we consider a counterfactual setting without equalizing Mexican mobility. In this counterfactual, the difference in employment growth rates among less-skilled workers in cities facing different labor demand shocks would have been roughly 40 percent larger than what was observed. This smoothing represents an understudied potential benefit of the changing demographic composition of the low-skilled population through immigration. As the U.S. works to reform its immigration system, policymakers should consider the potential benefits of maintaining the geographic flexibility of low-skilled foreign-born workers.

The finding of a strong locational response of the Mexican-born to labor demand has a number of additional important implications. First, this paper provides further evidence that immigration inflows respond to demand conditions, which remains a candidate explanation for the observed small correlation between immigrant inflows and native wage and employment outcomes. Second, a number of authors have used geographic identification strategies to study how the low-wage labor market responds to other shocks or policies. Our

\(^{4}\)See Borjas (2001) and Cadena (forthcoming) for additional examples of this finding. Card (2001), among others, documents this low correlation.
finding suggests that mobility among immigrants may confound such a design, even if the mobility responses among natives are minimal.

The remainder of the paper is organized as follows. Section 2 discusses the labor market adjustment to demand declines during the Great Recession, including a conceptual framework outlining the importance of wage rigidity and negative demand shocks to our empirical approach. Section 3 discusses data sources, outlines our empirical approach, and provides the main results of the empirical analysis along with multiple robustness checks. Section 4 concludes and discusses additional implications of Mexican-born mobility for the low-skilled labor market.

2 Labor Demand Shocks and Geographic Mobility

2.1 Wage Rigidity and Demand Shocks

One of the most noteworthy features of the Great Recession was the prevalence of large employment declines rather than wage cuts. In fact, as several authors have documented, inflation over this time period was minimal, and nominal wages continued to grow, albeit at a relatively slow rate (Daly, Hobijn and Lucking 2012a, Daly, Hobijn and Wiles 2012b, Rothstein 2012). As discussed by Daly et al. (2012a), the observed employment-based response in lieu of wage cuts is consistent with employers facing a fairness constraint in bargaining with employees, wherein cuts to the nominal wage in response to demand changes are considered exploitative.\footnote{Kahneman, Knetsch and Thaler (1986) provide survey results with direct support for this hypothesis. Respondents perceive real wage cuts in response to product demand declines as “unfair” in a low inflation environment (when nominal wages must be cut) but “fair” in a high inflation environment (when nominal wages are increased but at a rate lower than inflation). Consistent with this idea, Card and Hyslop (1997) provide empirical evidence that in previous recessions, inflation likely “greased the wheels” of the labor market by allowing firms to cut real wages without reducing nominal compensation below workers’ reference point.}
Figure 1 shows the national employment to population ratio from 1979 to the present. This ratio fell sharply between late 2007 and mid-2009, declining by nearly five percentage points, indicating substantial labor market adjustment on the employment margin. Compared to the pre-recession trend, it is clear that employment growth stalled by 2007, so in our empirical analysis we consider 2006 as the pre-recession baseline period and 2010 as the post-recession period.

Figure 2 compares employment and wage changes over this time period. This figure combines payroll employment information from the CES with calculations from Rothstein (2012) of changes in wage rates over the same time period. All values represent proportional changes compared to the same month in the previous year. Average wages are roughly constant over this time period, although they rise in real terms in 2008, which reflects a combination of approximately flat nominal wages and price deflation. Using the panel dimension of the CPS, the “Within-Worker Wages” series exhibits mildly rising wages for workers observed in the reference month and in the preceding year. These results show no evidence of falling wages, even when employment was falling by 5% per year in mid 2009.

In our empirical work, we exploit this downward wage rigidity and the fact that nearly all local markets experienced declining labor demand in order to construct a measure of the relative magnitude of demand shocks. As demonstrated in Figure 3, under these conditions demand shocks are observable directly from changes in local employment. Initially, the market wage $w$ and employment $L^0$ are determined by the intersection of labor demand, $D^0$, and labor supply, $S$. We allow for the realistic possibility that initial employment $L^0$ is less than the working-age population, $N^0$. The market then faces a decline in labor demand, represented by a leftward shift in the labor demand curve to $D^1$. Given downward rigid wages, employment falls to $L^1$ with the magnitude of employment change determined entirely by the difference between $D^1(w)$ and $D^0(w)$, i.e. by the size of the horizontal shift in the demand curve.
Thus, with a negative labor demand shock and downward rigid wages, one can directly observe the size of the demand decline simply by comparing the quantity of employment before and after the shock. Because the wage floor is binding, this measure of declining labor demand does not depend in any way on the shape of the labor demand or labor supply curve. Moreover, even if the supply curve moves left following the shock as a result of labor migration, the demand decline will still be directly observable in employment as long as supply does not decline by more than demand does. This condition will almost certainly hold when all local markets face negative demand shocks, as downward rigid pre-shock wages will bind in all markets.

Given these observations, in the remainder of the paper we measure each city’s decline in labor demand as the proportional decline in observed payroll employment, and then examine how local labor supply responded to spatial variation in these observable changes in labor demand. It is important to emphasize that this approach is appropriate only because of the particular features of the labor market during the Great Recession and would not be applicable in periods with increasing labor demand or flexible wages.

2.2 Geographic Variation in Labor Demand Shocks

As shown in Figure 4, there was considerable geographic variation in the depth of the recession. The hardest hit states (e.g. Nevada, Michigan, Florida) lost more than ten percent of employment from 2006-2010, while a few states (including North and South Dakota and Texas) experienced modest employment growth over the same period. Our primary specifications will define a local labor market as a metropolitan area, and Figure 5 provides time series information on employment for the metro areas with the largest decline, largest increase, and the median change in employment over this same time period, showing substantial variation across cities.
Our estimation strategy relies on variation in employment declines across cities and across industries within those cities. Uncovering the sources of this geographic variation is an objective of ongoing research. Mian and Sufi (2012) show that counties with higher average household debt to income ratios in 2006 experienced larger declines in household expenditure and hence larger employment declines, particularly in nontraded industries. Greenstone and Mas (2012) show that counties whose small businesses borrowed primarily from banks that cut lending following the financial crisis experienced larger employment declines. Our analysis uses the resulting geographic variation in the depth of the recession from these and other sources to identify effects of labor market strength on individuals’ location choices. We therefore rely on the assumption that geographic variation in employment declines is uncorrelated with other changes in the value of living in particular labor markets that might influence location choices. We address this assumption directly by including a number of controls for changes in amenities, considering a pre-recession falsification test, and using an instrumental variables strategy based on pre-recession local household leverage, following Mian and Sufi (2012). The results are very similar to OLS, supporting the notion that local labor demand shocks were exogenous to location choices.

2.3 Earnings-Sensitive Mobility by Demographic Group

If workers select geographic labor markets in order to maximize earnings, the large spatial differences in demand shocks will lead to strong incentives for workers to move away from areas experiencing severe declines to areas that were less negatively affected. Previous work has shown a large skill gradient in this mobility response, with college-educated workers much more likely to make earnings-maximizing location choices (Bound and Holzer 2000, Wozniak 2010). Yet, to our knowledge, there is no study examining the relative responses

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6 Chodorow-Reich (2013) provides direct evidence that firms with greater exposure to troubled lending institutions experienced greater employment losses.
of immigrants and native-born workers to geographic differences in labor demand shocks.

There are two primary reasons why immigrants may be more likely to select labor markets with relatively stronger demand. First, immigrants may be more likely to make a long-distance move in general. Immigrants have already revealed a willingness to make at least one long-distance move, and because they have already left their home country, they likely have weaker attachment to any specific U.S. labor market. Second, immigrants may be more likely to make earnings-maximizing moves when they migrate because they have less access to social safety net payments or have a short time horizon in which to achieve earnings goals in the U.S. labor market.

To address the first possibility, Table 1 provides one-year mobility rates calculated from questions in the ACS about where respondents lived in the previous year. The reported numbers are average yearly mobility rates throughout our study period (2006-2010). Consistent with conventional wisdom, in all cases the more educated portion of each demographic group exhibits a higher mobility rate. Throughout our analysis, we consider the mobility of Mexican-born individuals separately from that of immigrants from other source countries, and this table provides these mobility rates at a corresponding level of detail. Not surprisingly, the foreign-born are more likely to have moved internationally. Among the low-skilled, however, natives are more likely to have moved within the U.S. across an MSA border.\footnote{Moves that begin or end in an area that is not identifiable or not in an MSA are counted in these averages unless both the current and previous location are not in a valid MSA.}

Overall, the foreign-born exhibit somewhat larger unconditional mobility rates resulting from their increased international mobility. These differences are more modest when comparing natives to Mexican-born workers, with the largest difference of 0.9 percentage points appearing for less educated men. Thus, the observed differences in geographic responsiveness to labor demand shocks that we present below partly reflect these differences in the unconditional probability of moving as well as differences in the probability of choosing
a strong labor market conditional on moving.

Even with similar unconditional mobility rates, there are multiple reasons why immigrants may be more responsive to differences in earnings prospects. First, immigrants may be less likely to receive Unemployment Insurance (UI) and other social safety net programs, the existence of which tends to reduce geographic differences in total income (Tatsiramos 2009). Immigrants may be less likely to qualify for UI based on their legal status and they may be more likely to be treated as independent contractors by employers. This explanation may be especially important for Mexican-born immigrants, more than half of whom are in the US without authorization (Passel 2005). They may also be less willing to apply for benefits even if they do qualify.

Figure 6 shows UI benefit receipt by nativity groups for low-skilled men. The time trends are similar across groups, with benefit receipt rising sharply in 2008. In all time periods, however, the foreign-born are substantially less likely to receive benefits, which implies that immigrants’ total incomes are more dependent on their labor market earnings.

Immigrants may also have a generally stronger attachment to the labor market even when eligible for the same benefits as natives. In particular, many Mexican immigrants report moving to the U.S. intending a relatively short stay, often planning to work until having saved a particular amount of money to invest back in Mexico (Massey et al. 2003). Additionally, Massey et al. (2003) describe the decision for some individuals to migrate to the U.S. from Mexico as part of a larger household’s diversification of human capital across labor markets. Workers with either of these types of motivations will find extended periods of unemployment especially costly and may therefore be more willing to move in order to find new employment more quickly. Figure 7 presents time-series evidence on unemployment duration consistent with this hypothesis. Although unemployment durations rise for all

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8The patterns across groups for high-skilled men are broadly similar, although the high-skilled are less likely to claim benefits in general.
groups during the recession, Mexican-born workers have markedly shorter unemployment durations in all time periods, consistent with a broader or more intense job search in order to find new employment sooner after losing a job.

Finally, immigrants, and the Mexican-born in particular, have access to robust networks that allow information about job openings to flow quickly (Munshi 2003). These networks also lower the costs of a temporary move and increase the probability that a move across labor markets will result in a favorable employment outcome. Each of these differences suggests that immigrants will be more likely to make earnings-improving moves in response the the geographic variation in labor market shocks created by the Great Recession.

3  Empirical Strategy and Results

3.1  Data Sources and Specifications

Based on the discussion in the previous section, our primary empirical strategy examines changes in a city’s working age population (separately by skill level, sex, and nativity) as a function of the change in that city’s payroll employment. Our dependent variable is the proportional change in the population of the relevant demographic group from 2006-2010, calculated from the American Community Survey. Our sample includes individuals aged 18-64, not currently enrolled in school, and not living in group quarters. Because we will examine tightly defined groups of workers, we limit our analysis to cities with a population of at least 100,000 adults meeting these sampling criteria. Additionally, we limit the sample to cities with at least 60 observations for Mexican-born individuals (our smallest subsample) in the 2006 ACS in order to avoid overly noisy measures of the base-year population. These city-level restrictions are imposed for all skill and nativity groups, resulting in a sample of

\[\text{We obtained the data from IPUMS (Ruggles, Alexander, Genadek, Goeken, Schroeder and Sobek 2010).}\]
98 cities.

Although we do not include a formal location choice model, both Borjas (2001) and Cadena (forthcoming) provide theoretical justifications for using linear models to examine proportional changes in supply as a function of changes in expected earnings.\textsuperscript{10} Note that with rigid wages, the proportional change in expected earnings that a labor market offers (prior to any mobility) will be approximately equal to the proportional change in the number of jobs. We therefore use proportional changes in employment as our independent variable. These are calculated using employment information from County Business Pattern (CBP) data, which are available by county and industry and cover employment at non-farm private sector firms. The metropolitan area definitions used in the ACS and the CBP are not entirely consistent, so we aggregate county-level employment information in the CBP data to match the definitions used in the ACS\textsuperscript{11}

Our specification is therefore:

\[
\frac{P_{2010} - P_{2006}}{P_{2006}} = \beta_0 + \beta_1 \frac{E_{2010} - E_{2006}}{E_{2006}} + \epsilon_c
\] (1)

Figure 8 provides an example of this specification, and it highlights one of the key findings: among the low-skilled, only the foreign-born respond to differential employment changes by altering their location choices. One concern with this basic specification is that employment changes may have been disproportionately incident on foreign-born workers. In this case, overall employment changes will understate the change in expected earnings experienced by low-skilled workers, and it may do so more for the foreign-born than for native-born workers.

Although the CBP data do not collect employment information separately by demographic or education groups, they do include information on employment by industry. As

\textsuperscript{10}The linearity assumption allows for the value of fixed amenities to be differenced out, which avoids the incidental parameters problem.

\textsuperscript{11}The MSAs in Connecticut do not coincide well with counties. We therefore treat the entire state of Connecticut as an individual metropolitan area.
shown in Figure 9, there was considerable variation across industries in employment declines. Further, Figure 10 demonstrates that Mexican-born workers (the largest single group among the low-skilled foreign-born) are more concentrated in the types of jobs that tend to experience the largest declines.

We address this difference by constructing group-specific employment changes that account for these differing industrial compositions. We begin by noting that the proportional change in city $c$’s overall employment can be expressed as a weighted average of industry-specific ($i$) employment changes, with weights equal to the industry’s share of total employment in the initial period.

$$\frac{Emp_{t0}\text{2010} - Emp_{t0}\text{2006}}{Emp_{t0}\text{2006}} = \sum_i \varphi_{ic} \frac{Emp_{t0}\text{2010} - Emp_{t0}\text{2006}}{Emp_{t0}\text{2006}}$$

with

$$\varphi_{ic} = \frac{Emp_{t0}^{t0}}{\sum_j Emp_{t0}^{j0}}$$

The relevant change in employment for a given demographic group can be calculated by using $\varphi_{ic}$ industry shares that are specific to each group, rather than the shares for the local economy as a whole. We calculate these shares at the group $\times$ city level using data from the 2005 and 2006 ACS.\footnote{We use two years in order to more accurately measure the shares for smaller demographic groups. There are no substantial changes in the overall distribution of industries by demographic group from 2005-2006. The 2000 Census would provide a larger sample size, but there were substantial changes in the industry distribution of employment between 2000 and 2006, particularly for foreign-born workers, so we did not pursue this approach.}

One caveat worth noting is that the CBP data do not cover employment in agriculture, private household services, or the informal sector. Thus, we are unable to adjust our group-specific employment measure to account for the fact that foreign-born workers are disproportionately represented in these sectors. Given our focus on employment in metropolitan areas, the omission of agricultural employment is unlikely to play a meaningful role. If employment
declines in private household services and in the informal sector are similar in size to those in other observable sectors, then our results will be unaffected. However, it is possible that foreign-born workers face larger employment declines than our measures would capture by virtue of missing these sectors. Given the substantial difference in the responsiveness of native and foreign-born individuals, this issue seems unlikely to drive the results.

Figure 11 repeats the analysis in Figure 8 using group-specific changes in employment. Note that the more concentrated industrial distribution of the foreign-born leads to greater variation across cities in employment changes relative to those experienced by natives. Importantly, however, the large difference between the elasticities for native and foreign-born workers remains even after accounting for the different industry distributions for the two groups.

Our preferred specification also weights each city by the number of group members (e.g. low-skilled foreign-born men, high-skilled native-born women, etc.) living in the city in 2006. Figure 12 provides the weighted versions of Figure 8 with the size of the marker proportional to the weight the city receives. There are two primary reasons that we prefer the weighted estimates. First, proportional changes in population are measured more precisely in cities with larger base populations, and, as this figure shows, the weighting scheme places relatively little weight on many of the cities with very large and imprecisely measured proportional changes. Second, this weighting scheme also ensures that the regression line fits through the weighted means, which implies that a city with the overall average employment change will be predicted to experience the overall average population growth.

Although we will focus the remainder of our attention on the population-weighted regressions using group-specific employment declines, neither of these choices substantively alters the results. We provide a complementary set of results to our main tables in the Appendix, as discussed in more detail in Section 3.5, the relevant comparison for a city’s change in employment probability is the nationwide decline in the employment to population ratio.
for completeness.

3.2 Geographic Labor Supply Elasticities by Demographic Group

Table 2 provides estimated elasticities of Equation 1 for groups defined by skill, sex, and nativity. Each coefficient in the table comes from a separate regression. We focus on the specifications using the group-specific employment changes (the bottom entry in each cell), although we include the results using total employment changes (the top entry in each cell) for completeness. Note that the qualitative conclusions are similar with either employment measure.

The results in each nativity group column show a strong difference in supply elasticities by skill group. Workers with at least some college education are much more responsive than are workers with at most a high school degree. As an example, for native-born men or women with at least some college, a ten percent increase in employment leads to between a four and five percent increase in the size of a city’s local population with that education level. In contrast, the results for natives with at most a high school degree exhibit much smaller point estimates that cannot be statistically distinguished from zero.

There are also substantial differences among skill groups by nativity, with the foreign-born consistently more responsive than the native-born. Most notably, the results for less skilled foreign-born workers are in stark contrast to those for native-born workers; these elasticities for low-skilled immigrants are of similar magnitude to those of high-skilled natives and are strongly statistically significant.

As discussed in Section 2.3, there are several reasons why Mexican-born immigrants’ location choices may be particularly responsive to labor market conditions. Consequently,

\[\text{This result likely partially results from the fact that most immigrants with a college-level education are in the U.S. on an employment-based visa. Firms in places with higher relative demand almost surely apply for a disproportionate share of these visas, which will lead directly to a reallocation of high-skilled immigrants toward these cities. This dynamic among newly arriving immigrants, however, is unlikely to account for the full difference in elasticities between the foreign-born and the native-born.}\]
the third and fourth columns of Table 2 show the results of estimating our primary specification using population and employment changes calculated separately for Mexican-born immigrants and for those from all other source countries. These estimates reveal that the large supply response among low-skilled foreign-born individuals is driven almost entirely by immigrants from Mexico. In fact, the elasticity of Mexican-born population with respect to jobs is of a similar magnitude to that of high-skilled native workers for both men and women. For reference, Figure 13 plots the regressions for low-skilled Mexican-born and other foreign-born men, showing that the relationships summarized in the regression results are not driven by any particular set of cities and appear to hold broadly throughout the country.

These results confirm the well-known empirical regularity that highly-skilled natives respond much more strongly than do less skilled natives by moving in response to geographic variation in local labor demand. However, the fact that less skilled Mexican-born immigrants respond so strongly is to our knowledge a novel finding. We therefore spend the remainder of the paper examining this result and its implications in detail.

One potentially important interpretation issue stems from our assumption that changes in labor demand are reflected entirely in changes in employment rather than changes in wages. While the data largely support this assumption, as discussed above, it remains possible that there is some correlation between employment changes and wage changes. If the two are positively correlated, then our analysis overstates the independent effect of employment on population changes. If employment and wage changes are negatively correlated, we understate the independent effect of employment. However, our primary interest is on the differences across demographic groups rather than on the level of the effect per se. We see no reason to expect substantially different relationships between wages and employment for Mexican-born workers compared to native-born workers of the same sex and skill level. Thus, while wage changes may result in overstatement or understatement of the independent effect of employment on location choices, this potential bias should be proportional across
demographic groups, and our cross-group comparisons remain valid.

3.3 Robustness of the Mexican-Native Elasticity Difference

In order to interpret these results as evidence that the recession caused the reallocation of workers around the U.S., we must rule out any other determinants of location choice that may be correlated with local changes in demand. In this section we focus on the response of low-skilled Mexican-born men, ensuring that their notably large geographic supply response, reproduced in Column (1) of Table 3, is robust to various controls and alternate explanations.

One potential concern is that the Mexican-born population has been diffusing across locations since 1990, with rapid growth in new areas and slower growth among traditional enclaves (Card and Lewis 2007). If traditional immigrant destinations also experienced systematically deeper demand declines, the observed relocation may simply reflect the continuation of this diffusion rather than the effect of changing employment prospects. We address this concern by controlling for the Mexican-born share of each city’s population in 2006, the base year of our long difference, in Column (2) of Table 3. Because the dependent variable is the difference in population, this control allows for differential trends based on the degree to which a city was a traditional location. The coefficient on the enclave measure is negative, which is consistent with continuing diffusion. Including this variable, however, has essentially no influence on the supply elasticity coefficient, suggesting that the geographic variation in the depth of the recession was roughly uncorrelated with a city’s status as an enclave.

Over this time period, a number of states enacted legislation designed to influence the inflows of unauthorized immigrants. Bohn and Santillano (2012) have collected information on these laws, and we include additional controls based on a database they provided. To some extent, these types of policies may be endogenous to local demand conditions. If
so, conditioning on these policies may be over-controlling and lead to estimated supply elasticities that are biased downward. Nevertheless, for completeness, in column (3), we add an indicator for states that implemented a new policy (between 2006 and 2009) affecting the employment of unauthorized immigrants.\footnote{Perhaps the most notable of these policies was the Legal Arizona Workers’ Act, which required employers to participate in the federal E-Verify program. This program, which had previously been optional, led to a decline in the foreign-born population of Arizona relative to other states (Bohn, Lofstrom and Raphael forthcoming). The inclusion of this control has relatively little influence on the estimated supply elasticity of Mexican-born residents.} Perhaps the most notable of these policies was the Legal Arizona Workers’ Act, which required employers to participate in the federal E-Verify program. This program, which had previously been optional, led to a decline in the foreign-born population of Arizona relative to other states (Bohn, Lofstrom and Raphael forthcoming). The inclusion of this control has relatively little influence on the estimated supply elasticity of Mexican-born residents.

In the final column of Table 3, we include an indicator for whether a state entered into a 287(g) agreement with the federal government between 2006 and 2009. These policies are cooperation agreements between local law enforcement and the Department of Homeland Security (DHS) that allow local police to enforce federal immigration law. This control enters with a large coefficient (equivalent to a roughly one standard deviation difference in employment growth), and its inclusion lowers the estimated effect of labor demand somewhat, although it remains at 85 percent of the magnitude of the bivariate coefficient. It is important to note that these anti-immigrant policies may have directly affected a location’s attractiveness, but may also be correlated with other changes in the local environment faced by immigrants that affect their location choices. For our purposes, it is not necessary that these controls estimate the effect of these policies, only that they account for relevant changes in the attractiveness locating in a particular city. For completeness, Table 4 provides results analogous to column (4) of Table 3 for all nativity, skill, and gender groups. The results show that the pattern of elasticities identified in Table 2 remains, even when controlling for diffusion from enclaves and new state immigration policies.

\footnote{For each of these state-level controls, we calculate population-weighted values for MSAs that cross state lines.}
Although the Mexican-born elasticity is robust to the controls just mentioned, it is still possible that unobserved factors other than local demand changes contributed to the observed relationship. We use a false experiment approach to rule out persistent unobserved factors by regressing the pre-recession (2000-2006) proportional change in low-skilled Mexican-born population on the employment growth from 2006-2010. Other than the change in the timing for the dependent variable, these specifications are identical to main analysis. Figure 14 implements this falsification test for low-skilled Mexican-born and native-born men. We see that natives’ pre-recession population growth rates are essentially uncorrelated with the subsequent labor demand changes, showing no sign of preexisting trends. For Mexican-born men, we find a negative but fairly imprecisely estimated relationship. Thus, if anything, the changes in population growth that we observe during this period represent a reversal of pre-recession trends. These findings rule out the hypothesis that low-skilled Mexican-born workers were coincidentally leaving the cities that would be hardest-hit during the recession even before it began, and further emphasize the stark differences in mobility between low-skilled Mexican-born and native-born workers.

A final possibility is that unmeasured factors drive population changes and that these population changes result in changes in employment, either through decreasing product demand or by mechanically reducing the number of workers. This mechanism represents a form of reverse causality in which population growth drives employment growth. We address this challenge in two ways. First, note that this mechanism would apply to all demographic and nativity groups. Thus, this alternative explanation cannot explain the lack of a relationship between native population changes and employment changes, which exists despite non-trivial cross-city mobility (see Table 1). Moreover, since Mexicans often remit a substantial portion of their income rather than spending it locally, the reverse causality issue would be stronger for natives, and would thus bias the difference in elasticities in the opposite direction of the observed gap.
Second, we use an instrumental variable for employment changes that is plausibly exogenous to counterfactual population growth and strongly relates to changes in local employment through well-understood economic mechanisms. The instrument is based on Mian and Sufi’s (2012) finding that counties with more highly leveraged households experienced larger employment losses during the Great Recession. Importantly, they find that these employment losses were concentrated in industries providing goods and services locally, suggesting that the tightening of credit during the financial crisis led to a decline in consumer demand, and that this decline was largest among households that were more indebted. Mian and Sufi (2011) identify several mechanisms through which household leverage drove declining demand. Indebted households became less able to roll over their debt and were thus forced to spend a greater share of their incomes on debt service rather than consumption. Households in cities with higher average leverage had a large share of their debts in mortgages, and many may have treated the annual increase in home value as “income,” which disappeared during the crisis. Finally, some households may have decided that their previous levels of consumption were unsustainable and decided to find a new equilibrium spending path. This variable therefore isolates a portion of the geographic variation in employment changes that occurred as a result of changes in local demand through identifiable economic mechanisms related to the financial and housing crises.

We construct the household leverage ratio analogously to Mian and Sufi (2012), aggregating MSA-level variables from county-level information provided by Equifax (total household debt) and the Internal Revenue Service (total income).\(^{16}\) Table 5 presents the results of these specifications, which also include the controls introduced in Table 3. On the whole, the results are quite consistent with the OLS results in Column (4) of Table 4. The pattern of

\(^{16}\)Mian and Sufi (2012) provide more detail on the data sources. The Equifax data are available through the Federal Reserve Bank of New York. Our restriction to large MSAs avoids the concern that only a portion of the counties used in the original paper are publicly available, as the restricted data are for counties with small populations.
elasticities continues to show strong differences by skill level, and among the low-skilled, only
the Mexican-born population responds to changes in local labor demand. The consistency
of the OLS and IV results suggests that, as expected, the OLS specifications are unlikely to
be contaminated by remaining omitted variables or simultaneity.

3.4 Why are the Mexican-Born More Mobile?

The preceding results establish that, on average, less skilled Mexican-born workers were
more responsive to labor market conditions than were natives during the Great recession.
On its own, this result implies that recent waves of low-skilled immigration have raised the
average responsiveness of the low-skilled population resident in the U.S., which will tend to
reduce the geographic variation in labor market outcomes for low-skilled workers. However,
we remain interested in why the Mexican-born have a larger locational elasticity. There are
several candidate demographic reasons, including the fact that Mexicans are, on average,
younger and more likely to rent rather than own their home.

We use a propensity score reweighting strategy to determine whether the differential
elasticities are explained by these different observable characteristics or whether they are
due to some other difference (e.g. weaker ties to a particular US labor market, a revealed
preference for moving for employment, lower risk aversion, etc.). We begin by running a
probit regression in which we predict Mexican-born status based on age, marital status,
detailed educational attainment, and home ownership. These regressions are run separately
for each education and gender category. We then use these weights to calculate city-level
population and employment changes using native workers whose demographics, on average,
match those of their Mexican-born counterparts. We then repeat our main analysis for
this reweighted group of natives. Figure 15 shows these results for low-skilled men, and
Table 6 provides complete results for all four demographic groups. Even after making these
adjustments, we find no evidence that natives move toward cities with better jobs prospects, which suggests that the Mexican-born are more responsive for reasons other than these observable determinants of mobility. These results complement our earlier finding that the Mexican-born are not substantially more likely to move in general; they are, however, more likely to respond to labor market conditions when moving.

Another difference between the Mexican-born and the native-born is the variety of ways that the Mexican-born population can adjust to differences in labor demand. We therefore examine the importance of each of these mechanisms in creating the differential population growth rates. A city’s Mexican-born population can adjust through the following channels:

- C1: Mexicans arriving from abroad after 2006
- C2: Inter-state movement of Mexicans who were residing in the country in 2006
- C3: Previously resident Mexicans leaving the country
- C4: Resident Mexicans who age into or out of the sample
- C5: Resident Mexicans who enter or leave the sample due to a change in schooling status

By definition,

\[
\Delta \frac{mex_c}{mex_{c,2006}} = \frac{C_{1c}}{mex_{c,2006}} + \frac{C_{2c}}{mex_{c,2006}} + \frac{C_{3c}}{mex_{c,2006}} + \frac{C_{4c}}{mex_{c,2006}} + \frac{C_{5c}}{mex_{c,2006}}. \tag{2}
\]

Assume that each reallocation channel is linearly related to the change in group-specific employment as follows:

\[
\frac{C_{1c}}{mex_{c,2006}} = \beta_{01}^1 + \beta_{11}^1 \frac{\Delta_{emp_c}}{emp_{c,2006}} + \epsilon_c^1 \tag{3}
\]

\[
\frac{C_{2c}}{mex_{c,2006}} = \beta_{02}^2 + \beta_{12}^2 \frac{\Delta_{emp_c}}{emp_{c,2006}} + \epsilon_c^2 \tag{4}
\]
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\[
\frac{C_3_{c\text{mex}}}{c_{\text{mex}}2006} = \beta_0^3 + \beta_1^3 \Delta emp_{c\text{mex}} + \epsilon_c^3 \tag{5}
\]

\[
\frac{C_4_{c\text{mex}}}{c_{\text{mex}}2006} = \beta_0^4 + \beta_1^4 \Delta emp_{c\text{mex}} + \epsilon_c^4 \tag{6}
\]

\[
\frac{C_5_{c\text{mex}}}{c_{\text{mex}}2006} = \beta_0^5 + \beta_1^5 \Delta emp_{c\text{mex}} + \epsilon_c^5 \tag{7}
\]

Summing these equations yields

\[
\Delta mex_{c\text{mex}}2006 = (\beta_0^1 + \beta_0^2 + \beta_0^3 + \beta_0^4 + \beta_0^5) + (\beta_1^1 + \beta_1^2 + \beta_1^3 + \beta_1^4 + \beta_1^5) \Delta emp_{c\text{mex}} + \epsilon_c^1 + \epsilon_c^2 + \epsilon_c^3 + \epsilon_c^4 + \epsilon_c^5. \tag{8}
\]

\[
\Delta mex_{c\text{mex}}2006 = \beta_0 + \beta_1 \Delta emp_{c\text{mex}} + \epsilon_c, \tag{9}
\]

where \(\beta_0 \equiv (\beta_0^1 + \beta_0^2 + \beta_0^3 + \beta_0^4 + \beta_0^5), \beta_1 \equiv (\beta_1^1 + \beta_1^2 + \beta_1^3 + \beta_1^4 + \beta_1^5),\) and \(\epsilon_c \equiv (\epsilon_c^1 + \epsilon_c^2 + \epsilon_c^3 + \epsilon_c^4 + \epsilon_c^5).\)

Given estimates of \(\beta_1^1\) through \(\beta_1^5\), one could divide the overall shift in Mexicans’ location choices in response to the recession into that occurring through each channel as \(\frac{\beta_1^1}{\beta_1}, \frac{\beta_1^2}{\beta_1},\) etc.

Channel C1 is directly observable in the ACS. All immigrants are asked their arrival year in every wave of the survey, and we can therefore estimate the number of Mexicans resident in each city who arrived before and after the base period. We can thus partition the total change in the following way for each city (suppressing city subscripts):

\[
\Delta mex = mex_{2006}^{\text{new}} + (mex_{2006}^{\text{pre}-2007} - mex_{2006}^{\text{pre}-2007}).
\]

In words, the change in the Mexican-born population consists of the number of immigrants who arrived in 2007 or later plus the change in the number of immigrants who arrived in the U.S. in 2006 or earlier. Notice that \(mex_{2006}^{\text{pre}-2007}\) is simply the resident population in 2006 by definition.

The first column (1) of Table 7 reproduces the result in column (1) of Table 3. The following two columns of Table 7 decompose the estimate in column (1) into estimates of \(\beta_1^1\)
and \((\beta_1^2 + \beta_1^3 + \beta_1^4 + \beta_1^5)\). The coefficient in column (2) implies that roughly 20 percent of the reallocation \((\frac{12.7}{12})\) occurred through differential inflows of new immigrants in response to differential demand shocks\(^{17}\). Note that fewer than 20 percent of Mexican-born immigrants living in the US in 2010 arrived over the preceding five years; thus these new arrivals are doing more than their “fair share” of the reallocation. The remaining 80 percent of the reallocation occurred through channels C2-C5, and this aggregate effect is reflected in the coefficient in column (3) from a regression of the proportional change in pre-2007 arrivals on the employment shocks. Column (4) provides a direct estimate of the contribution of C4 (net aging in) based on the number of individuals who are likely to have aged in and out of each city’s sample, and the results imply that the contribution of this channel is negligible\(^{18}\).

Although C5 is not directly observable in the ACS, it also likely contributes a negligible amount of the total.

Based on this decomposition, therefore, roughly 80 percent of the reallocation is occurring through migration among those who were resident in the country in 2006, either internally within the United States or by leaving the country (channels C2 and C3). There are, to our knowledge, no credible data sources that allow measurement of return migration flows to Mexico separately by previous residence in the US. In addition, the ACS asks respondents only about internal movement over the past year; the five year mobility question, standard in the decennial census, does not appear in the ACS. Therefore, further decomposing the importance of internal and return migration for each city remains beyond the scope of the available data. Nevertheless, it is clear that most of the reallocation is driven by immigrants who had previously arrived rather than through differential sorting of new arrivals. There is scope for both of channels C2 and C3 to have played a significant role. The total decline

\(^{17}\)This sorting could have occurred either through the same set of new arrivals choosing to go to alternate cities or by differential entry by potential migrants who would have targeted different cities, or through a combination thereof.

\(^{18}\)People between the ages of 18 and 21 in 2010 who arrived prior to 2007 are assumed to have aged in. Individuals 61-64 in 2006 are assumed to age out.
in pre-2007 immigrants over the 98 sample cities is roughly 12 percent, implying that there was a substantial amount of return migration. Yet 35 of these cities experienced an increase in pre-2007 immigrants, which can occur only through internal migration within the US.

### 3.5 Mexican Mobility Smooths Employment Outcomes

The previous results provide robust evidence that Mexican-born workers leave labor markets experiencing larger declines in labor demand in favor of markets facing smaller declines. This mobility will tend to equalize labor market outcomes across space for these workers. Further, to the extent that Mexican-born workers compete with similarly-skilled native-born workers, the earnings-sensitive mobility of the Mexican-born will also serve to arbitrage away geographic differences in labor market outcomes for less mobile natives (and non-Mexican immigrants).\(^{19}\) In this section, we use a simple framework to quantify this smoothing effect in the context of the Great Recession.

As discussed in Section 2.1, wages were downward rigid during the Great Recession, so the effect of declining labor demand was to lower employment rather than wages. We define smoothing as the degree to which equalizing migration arbitraged away geographic differences in workers’ expected earnings. Given rigid wages, proportional changes in expected earnings coincide with proportional changes in the probability of being employed, 

\[
\frac{d \ln (Pr(emp)_c \times E[w_c|emp])}{d \ln Pr(emp)_c} = \frac{d \ln Pr(emp)_c}{d \ln Pr(emp)_c}.
\]

One can therefore measure the degree of smoothing based on the observed relationship between local changes in the employment to population ratio \((d \ln e_{pop_c})\) and the local demand shock \((d \ln L_c)\). In the absence of any equalizing migration, the labor demand decline in each city will be completely reflected in the local change in \(e_{pop_c}\). In contrast, if earnings-sensitive migration is sufficient to equilibrate employment probabilities across cities, then there will be no relationship between the

\(^{19}\)Throughout the analysis, we group together workers without a high school degree and high school graduates. Evidence suggests that these two groups are nearly perfect substitutes although workers with a degree represent more effective units of labor (Card 2009).
local change in $e\text{pop}_c$ and the local demand shock.

To formalize this intuition, define the average proportional change in $e\text{pop}_c$ across cities as

$$d \ln e\text{pop} \equiv \frac{\sum_c N_c d \ln e\text{pop}_c}{\sum_c N_c} = d \ln L - d \ln N,$$  

(10)

where $L$ is employment, $N$ is population, and $d \ln L$ and $d \ln N$ are defined similarly to $d \ln e\text{pop}$. This implies

$$d \ln e\text{pop}_c - d \ln e\text{pop} = d \ln L_c - (d \ln N_c - d \ln N).$$  

(11)

One can therefore quantify the degree to which local labor markets are integrated across space by examining the relationship between local changes in $e\text{pop}_c$ and the local demand shock in the following linear specification, which accounts for the demeaning in (11) by including an intercept term\(^{20}\)

$$d \ln e\text{pop}_c = \beta_0 + \beta_1 d \ln L_c + \epsilon_c$$  

(12)

It is important to note that by omitting $d \ln N_c$ from this expression, $\hat{\beta}_1$ captures both the direct and indirect effects of declining labor demand. In particular,

$$\underset{\text{plim}}{\beta}_1 = \frac{\text{cov}(d \ln L_c, \ d \ln e\text{pop}_c)}{\text{var}(d \ln L_c)}.$$  

(13)

Plugging in the definition of $d \ln e\text{pop}_c$ in which $\nu_c$ represents random sampling error that is uncorrelated with $d \ln L_c$,

$$\underset{\text{plim}}{\beta}_1 = \frac{\text{cov}(d \ln L_c, \ d \ln L_c - d \ln N_c + \nu_c)}{\text{var}(d \ln L_c)} = 1 - \frac{\text{cov}(d \ln L_c, \ d \ln N_c)}{\text{var}(d \ln L_c)}$$  

(14)

\(^{20}\)Weighting by the city’s low-skilled population ensures that the regression fits through the population-level means.
This expression makes clear that labor demand shocks have a proportional direct effect on local changes in $epop_c$, but that the observed effect may be mitigated by equalizing migration reflected in a positive correlation between $d \ln L_c$ and $d \ln N_c$. In the absence of equalizing mobility, $\hat{\beta}_1$ will equal 1 if the employment changes are measured without error. Because we observe employment changes by industry, we can only approximate the employment losses incident on low-skilled workers, and it is likely that this measurement error will tend to attenuate the estimated coefficient.

Nevertheless, as the previous results have shown, significant equalizing mobility is only apparent for Mexican-born individuals. We therefore provide two separate analyses to determine how Mexican mobility has affected the incidence of demand shocks on local labor markets. First, we utilize differences across cities in the initial Mexican-born share of the low-skilled workforce to yield direct evidence that Mexican mobility smoothed employment-to-population ratios across space, even among native-born workers. Second, we quantify the extent to which the mobility of the Mexican-born has mitigated the relationship between local demand shocks and local labor market outcomes relative to a counterfactual in which the neither Mexican-born nor native-born populations responded to demand shocks. In both cases, by focusing on relative coefficients, we lessen the importance of measurement error in the demand shocks.

Among the 98 cities in our sample, there is a great deal of variation in the share of the low-skilled population that is Mexican-born. Values range from just over one percent in cities like St. Louis and Miami to more than 40 percent in parts of Texas and California. Cities with few Mexican-born immigrants have little scope for outmigration in response to a larger-than-average demand decline. Further, when selecting a new location, Mexican outmigrants are likely to prefer cities with higher Mexican-born populations, either because these populations are a direct amenity or because they proxy for unobserved amenities especially valued by the Mexican-born. Therefore, it is reasonable to expect that cities with greater pre-recession
concentrations of Mexican-born workers will experience changes in employment probabilities that are more similar to each other than are those of cities with lower concentrations.

To examine this hypothesis, we estimate a version of Equation (12) separately for cities with above- and below-median Mexican-born populations shares (among the low-skilled) in 2006. We begin with a specification examining the employment to population ratio for all low-skilled residents. Figure 16 provides a visual representation of the results of these regressions. The slope of the fitted line for the below-median cities (gray triangles) is +0.52, while the slope of the fitted line for above-median cities (black circles) is +0.28. An interaction model reveals that these slopes are statistically significantly different ($p = 0.006$).

These results thus directly confirm the important role of Mexican immigrants in diffusing local demand shocks.

One potential concern with this specification is that Mexican-born and other workers may not be perfect substitutes. In this case, the change in the overall low-skilled employment to population ratio may not properly reflect the change in employment probability experienced by non-Mexicans. To address this concern, Figure 17 provides an alternative specification with the native employment to population ratio as the dependent variable. Importantly, the only mechanism through which Mexican mobility can affect this ratio is by altering the numerator, i.e. by changing the probability that native workers are employed. The results are remarkably similar to the results in Figure 16, with the point estimates of the slope coefficients indistinguishable to the second decimal place. This pair of results therefore

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\[21\] The median Mexican-born share is roughly 14 percent. Atlanta has the highest share below the median and Sacramento has the lowest share above.

\[22\] We were concerned that the relatively small sample size (49 cities in each subsample) may lead to very influential outliers. To address this problem, we estimated this relationship using local linear regressions, and the estimated slopes are quite similar for cities experiencing negative demand shocks. We were also concerned that the above-/below-median cut was too coarse, so we estimated this relationship separately by quartiles of pre-recession Mexican share. The pattern of results is monotonic in the anticipated direction, although there is only a slight difference in slopes between the lowest and second-lowest quartiles. All results are available from the authors upon request.

\[23\] The p-value from a test that the slopes are equal is slightly higher (0.026), but the difference is still significant at standard levels.
implies that cities with a higher initial share of Mexican-born workers experienced more smoothing of employment outcomes, and that the benefits of this smoothing were experienced even among the much less geographically responsive native-born workers.

Given this evidence that Mexican mobility smoothed labor market outcomes for natives, we turn to the question of quantifying how much smoothing occurred in the aggregate as a result of Mexican mobility. To do so, we examine a counterfactual situation in which we “undo” the mobility of Mexican individuals in response to the local demand shocks. We use the estimate of the Mexican-born population elasticity estimates in Figure 12 to predict the percent change in Mexican-born population due to the relative demand shock. We then multiply this percent change by the number of Mexican-born individuals in 2006 to estimate the net change in the number of Mexican-born workers in each city due to the relative demand shocks. Using these estimates, we calculate counterfactual changes in employment to population ratios by subtracting a city’s “extra” Mexican-born population from its observed 2010 low-skilled population. By holding native populations fixed, we are considering the outcomes that would result before any native migration might replace Mexican migration.

The importance of the Mexican-born workforce’s mobility can be seen in the difference in the slope coefficients of Equation 12 using the observed and counterfactual changes in the employment to population ratios. The results of this estimation (on the entire sample of cities), are shown in Figure 18. Note that the counterfactual fitted line is steeper than the observed relationship, which implies that Mexican mobility substantially arbitraged the geographic variation in employment probabilities relative to the counterfactual. The slope in the observed data is +0.36 relative to a counterfactual slope of +0.52, and this difference is statistically significant at the 1 percent level. To understand the scale of this smoothing effect, consider two cities whose demand shocks were separated by two standard deviations, or 16 percentage points. An example pair is Las Vegas, NV, which experienced a 23 per-
cent decline in employment, and Dallas, TX, which experienced a more modest 7 percent employment decline. In the observed data, one would expect two such cities’ employment to population growth rates to differ by 5.8 percent. In the counterfactual without equalizing migration of Mexican-born workers, this difference would have been 2.5 percentage points, or 43 percent, larger. This calculation indicates that Mexican mobility substantially smoothed labor market outcomes across cities facing different shocks.

4 Conclusion

This paper has demonstrated that low-skilled Mexican-born workers’ location choices responded very strongly to the geographic variation in labor demand generated by the Great Recession. This behavior is in sharp contrast to low-skilled native-born workers and other foreign born workers, who show little response, and quite similar to that of highly-skilled natives. The large differences between low skilled Mexicans and natives remains even after controlling for possible diffusing of immigrants away from traditional enclave destinations and for new state-level immigration policies that may deter potential migrants. The strong response among low-skilled Mexicans was not part of a pre-existing trend and remains when using pre-shock household leverage as an instrument for changes in local labor demand. Thus, this novel finding reflects economically significant behavior and is quite robust to the method of measurement.

The high degree of mobility among low-skilled Mexican-born individuals has a number of potentially important implications. First, it suggests that as Mexican immigrants comprise a growing share of the less skilled labor force, this group’s average mobility has increased substantially. If this trend continues it will at least partly mitigate concerns that the relative lack of mobility among less skilled workers leads to large disparities in these workers’ wages across local labor markets (Bound and Holzer 2000). In fact, we have shown that
highly mobile Mexican-born workers partly arbitrated away spatial differences in employment outcomes faced by natives during the Great Recession. As U.S. policy makers seek ways to normalize the status of unauthorized workers and put in place legal channels for migrant workers, they should consider policies that maintain the geographic flexibility of foreign-born workers.

Second, this paper provides evidence that immigration inflows respond to demand conditions, and it suggests that immigrants continue to alter their locations in response to labor demand after residing in the country for some time. Although we are unable to precisely disentangle the contributions of internal migration and return migration to Mexico, the evidence suggests that a substantial share of the geographic reallocation of low-skilled Mexican-born workers occurred through the internal migration of previously resident immigrants. This internal migration behavior of immigrants is an understudied phenomenon, and deserves continued research.\footnote{The only paper we are aware of that documents internal migration of previously-resident immigrants is Maré, Morten and Stillman (2007), who study initial location choices and subsequent internal migration of foreign-born individuals in New Zealand.} These findings support previous evidence showing that immigrants’ location choices respond to exogenous changes in labor market conditions (Cadena forthcoming, Cadena 2010), potentially confounding research designs relying on geographic variation in immigration inflows to identify immigrants’ effects on natives.
References


___, “Native Competition and Low-Skilled Immigrant Inflows,” *Journal of Human Resources*, forthcoming.


Figure 1: Time Series of National Employment to Population Ratio, 1979-2013

Employment to Population Rate

Recession

Figure 2: Time Series of Wages and Employment, 2006-2010

Sources: Authors’ calculations from Current Employment Statistics data; Rothstein, 2012.
Figure 3: Demand Shocks with Rigid Wages
Figure 4: Changes in Employment 2006-2010, US States

Proportional Change in Employment 2006-2010

Source: Current Employment Statistics data.
Figure 5: Employment 2006-2010, Selected Metro Areas

Index of Employment Relative to July 2006

Employment index
12-month moving average

Median Change - Memphis, TN-MS-AR
Largest Increase - McAllen-Edinburg-Mission, TX
Largest Decrease - Detroit-Warren-Livonia, MI

Source: Authors’ calculations from Current Employment Statistics data.
Figure 6: Unemployment Benefit Receipt by Nativity 2000-2011

Source: Authors’ calculations from Current Population Survey data. Sample limited to men ages 18-64 with no more than a high school degree.
Figure 7: Unemployment Duration (Among Unemployed) by Nativity 2000-2012

Source: Authors’ calculations from Current Population Survey data. Sample limited to men ages 18-64 with no more than a high school degree. Average duration calculated among those who are unemployed in the reference month.
Figure 8: Population Change vs. Total Employment Change: Low-Skilled Men - Unweighted

Proportional Change in Total Employment

Source: Authors' calculations from 2006-2010 American Community Survey and County Business Patterns.
Figure 9: Employment Changes by Industry 2006-2010

Sources: County Business Patterns.
Figure 10: Employment Shares by Industry, Native- and Mexican-Born 2006-2010

Industries sorted by employment change: most negative to most positive.

Native-born
Mexican-born

Sources: Authors' calculations from American Community Survey Data (2005-2006).
Figure 11: Population Change vs. Group-Specific Employment Change: Low-Skilled Men - Unweighted

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Construction of group-specific employment changes described in the text.
Figure 12: Population Change vs. Group-Specific Employment Change: Low-Skilled Men - Weighted

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Construction of group-specific employment changes described in the text.
Figure 13: Population Change vs. Group-Specific Employment Change: Low-Skilled Men - Weighted

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Construction of group-specific employment changes described in the text.
Figure 14: Falsification Test: Population Change 2000-06 vs. Group-Specific Employment Change 2006-10

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Construction of group-specific employment changes described in the text.
Figure 15: Propensity Score Reweighting of Natives to Match Mexican-Born Observables

Low-Skilled Mexican-Born Men

Low-Skilled Native-Born Men - Reweighted

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Construction of group-specific employment changes and weights described in the text and in the appendix.
Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Employment changes are calculated for low-skilled workers generally (without regard to nativity). Construction of skill-specific employment changes and weights described in the text and in the appendix. Fitted lines are from a weighted regression using the total male low-skilled population as weights. The size of the markers for individual points is proportional to these weights. The slope coefficients are +0.52 (below-median) and +0.28 (above median). This difference in slopes is statistically significantly different from zero ($p < 0.01$).
Figure 17: Changes in Native-Born Male Low-Skilled Emp/Pop Ratio and Changes in Payroll Employment

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Employment changes are calculated for low-skilled workers generally (without regard to nativity). Construction of group-specific employment changes and weights described in the text and in the appendix. Fitted lines are from a weighted regression using the native-born male low-skilled population as weights. The size of the markers for individual points is proportional to these weights. The slope coefficients are +0.52 (below-median) and +0.28 (above median). This difference in slopes is statistically significantly different from zero ($p < 0.05$).
Figure 18: Observed and Counterfactual Relationship between Emp/Pop Changes and Demand Declines

Source: Authors’ calculations from 2006-2010 American Community Survey and County Business Patterns. Employment changes are calculated for low-skilled workers generally (without regard to nativity). Construction of skill-specific employment changes and weights described in the text and in the appendix. Fitted lines are from a weighted regression using the total male low-skilled population as weights. The size of the markers for individual points is proportional to these weights. The construction of the counterfactual employment to population ratios is described in more detail in the text. The slope coefficients are +0.52 (counterfactual) and +0.36 (actual). This difference in slopes is statistically significantly different from zero ($p < 0.01$).
Table 1: One Year Mobility Rates 2006-2010

<table>
<thead>
<tr>
<th></th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Men, High-school or less</strong></td>
<td></td>
<td></td>
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<tr>
<td>Abroad Last Year</td>
<td>1.9%</td>
<td>0.2%</td>
<td>1.8%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Moved Cities Last Year</td>
<td>3.3%</td>
<td>3.8%</td>
<td>3.2%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Total</td>
<td>5.3%</td>
<td>4.0%</td>
<td>4.9%</td>
<td>5.6%</td>
</tr>
<tr>
<td><strong>Panel B: Men, Some college or more</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abroad Last Year</td>
<td>2.8%</td>
<td>0.3%</td>
<td>1.9%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Moved Cities Last Year</td>
<td>4.6%</td>
<td>4.5%</td>
<td>3.4%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Total</td>
<td>7.4%</td>
<td>4.8%</td>
<td>5.4%</td>
<td>7.7%</td>
</tr>
<tr>
<td><strong>Panel A: Women, High-school or less</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abroad Last Year</td>
<td>1.8%</td>
<td>0.1%</td>
<td>1.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Moved Cities Last Year</td>
<td>2.9%</td>
<td>3.6%</td>
<td>2.7%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Total</td>
<td>4.7%</td>
<td>3.7%</td>
<td>3.8%</td>
<td>5.5%</td>
</tr>
<tr>
<td><strong>Panel B: Women, Some college or more</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abroad Last Year</td>
<td>2.8%</td>
<td>0.2%</td>
<td>1.7%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Moved Cities Last Year</td>
<td>4.1%</td>
<td>4.3%</td>
<td>3.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Total</td>
<td>6.9%</td>
<td>4.5%</td>
<td>4.9%</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

Authors' calculations from ACS Data 2006-2010. Sampling criteria maintained from earlier tables. Sample also limited to individuals who lived in an MSA in either the survey year or the previous year. Numbers may not appear to add to total due to rounding.
Table 2: Population Changes and Change in Payroll Employment, Metro Areas 2006-2010

<table>
<thead>
<tr>
<th>Panel A: Men, High-school or less</th>
<th>Proportional Change in:</th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Employment</td>
<td>0.602**</td>
<td>0.160</td>
<td>0.733**</td>
<td>0.251</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.235)</td>
<td>(0.113)</td>
<td>(0.307)</td>
<td>(0.509)</td>
<td></td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.389***</td>
<td>0.088</td>
<td>0.566***</td>
<td>-0.003</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.138)</td>
<td>(0.084)</td>
<td>(0.137)</td>
<td>(0.382)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Men, Some college or more</th>
<th>Proportional Change in:</th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Employment</td>
<td>0.702**</td>
<td>0.518***</td>
<td>0.009</td>
<td>0.831***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.293)</td>
<td>(0.133)</td>
<td>(0.525)</td>
<td>(0.299)</td>
<td></td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.759***</td>
<td>0.490***</td>
<td>0.543</td>
<td>0.902***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.256)</td>
<td>(0.125)</td>
<td>(0.427)</td>
<td>(0.252)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel A: Women, High-school or less</th>
<th>Proportional Change in:</th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Employment</td>
<td>0.561****</td>
<td>0.119</td>
<td>0.720**</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.156)</td>
<td>(0.147)</td>
<td>(0.149)</td>
<td>(0.339)</td>
<td></td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.496***</td>
<td>0.207</td>
<td>0.473***</td>
<td>0.517</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.181)</td>
<td>(0.164)</td>
<td>(0.174)</td>
<td>(0.438)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Women, Some college or more</th>
<th>Proportional Change in:</th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Employment</td>
<td>0.505</td>
<td>0.348***</td>
<td>-0.019</td>
<td>0.570</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.361)</td>
<td>(0.118)</td>
<td>(0.558)</td>
<td>(0.353)</td>
<td></td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.784**</td>
<td>0.451***</td>
<td>0.029</td>
<td>0.925***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.312)</td>
<td>(0.133)</td>
<td>(0.487)</td>
<td>(0.310)</td>
<td></td>
</tr>
</tbody>
</table>

Each coefficient represents a separate bivariate regression of the proportional population change for the relevant group (from the American Community Survey) on the proportional change in overall employment or group-specific employment (from County Business Patterns data, using the demographic group's industry mix). CBP estimates include values binned for disclosure reasons. Specifications dropping binned values are similar. All regressions include an intercept term and 98 city observations. Heteroskedasticity-robust standard errors in parentheses. Observations weighted by city sample population in the relevant demographic group.
Table 3: Population Change vs. Employment Changes: Low-Skilled Mexican-born Men with Enclave and Policy Controls

<table>
<thead>
<tr>
<th>Dependent Variable: Proportional Population Change - Mexican-born Men, High-school or less</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportional Change in Employment</td>
<td>0.566***</td>
<td>0.579***</td>
<td>0.531***</td>
<td>0.491***</td>
</tr>
<tr>
<td></td>
<td>(0.137)</td>
<td>(0.139)</td>
<td>(0.112)</td>
<td>(0.112)</td>
</tr>
<tr>
<td>Enclave Measure</td>
<td>-0.201*</td>
<td>-0.224*</td>
<td>-0.260**</td>
<td></td>
</tr>
<tr>
<td>(Mexican-born Share of State Population)</td>
<td>(0.117)</td>
<td>(0.118)</td>
<td>(0.115)</td>
<td></td>
</tr>
<tr>
<td>New State Immigrant Employment Legislation</td>
<td>-0.055</td>
<td>-0.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.046)</td>
<td>(0.023)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New State 287g Policy</td>
<td></td>
<td></td>
<td>-0.103***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.036)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.013</td>
<td>0.065*</td>
<td>0.074**</td>
<td>0.083**</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.034)</td>
<td>(0.036)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.204</td>
<td>0.229</td>
<td>0.249</td>
<td>0.249</td>
</tr>
</tbody>
</table>

Each coefficient represents a separate regression of the proportional population change for the relevant group (from the American Community Survey) on the proportional change in overall employment or group-specific employment (from County Business Patterns data, using the demographic group’s industry mix) with controls for enclaves, state-level anti-immigrant employment legislation, and state-level 287g policies. CBP estimates include values binned for disclosure reasons. Specifications dropping binned values are similar. All regressions include an intercept term and 98 city observations. Heteroskedasticity-robust standard errors in parentheses. Observations weighted by city sample population in the relevant demographic group.
Table 4: Population Change vs. Employment Changes: All Groups with Enclave and Policy Controls

<table>
<thead>
<tr>
<th></th>
<th>Dependent Variable: Proportional Population Change</th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Men, High-school or less</strong></td>
<td></td>
<td>0.311*</td>
<td>0.080</td>
<td>0.491***</td>
<td>0.022</td>
</tr>
<tr>
<td>Proportional Change in Group-Specific Employment</td>
<td>(0.135)</td>
<td>(0.084)</td>
<td>(0.112)</td>
<td>(0.399)</td>
<td></td>
</tr>
<tr>
<td><strong>Panel B: Men, Some college or more</strong></td>
<td></td>
<td>0.824***</td>
<td>0.462***</td>
<td>0.193</td>
<td>0.920***</td>
</tr>
<tr>
<td>Proportional Change in Group-Specific Employment</td>
<td>(0.232)</td>
<td>(0.110)</td>
<td>(0.425)</td>
<td>(0.246)</td>
<td></td>
</tr>
<tr>
<td><strong>Panel A: Women, High-school or less</strong></td>
<td></td>
<td>0.478***</td>
<td>0.175</td>
<td>0.464***</td>
<td>0.463</td>
</tr>
<tr>
<td>Proportional Change in Group-Specific Employment</td>
<td>(0.171)</td>
<td>(0.163)</td>
<td>(0.172)</td>
<td>(0.434)</td>
<td></td>
</tr>
<tr>
<td><strong>Panel B: Women, Some college or more</strong></td>
<td></td>
<td>0.827***</td>
<td>0.449***</td>
<td>0.085</td>
<td>0.972***</td>
</tr>
<tr>
<td>Proportional Change in Group-Specific Employment</td>
<td>(0.281)</td>
<td>(0.117)</td>
<td>(0.509)</td>
<td>(0.304)</td>
<td></td>
</tr>
</tbody>
</table>

Each coefficient represents a separate regression of the proportional population change for the relevant group (from the American Community Survey) on the proportional change in overall employment or group-specific employment (from County Business Patterns data, using the demographic group’s industry mix) with controls for enclaves, state-level anti-immigrant employment legislation, and state-level 287g policies. CBP estimates include values binned for disclosure reasons. Specifications dropping binned values are similar. All regressions include an intercept term and 98 city observations. Heteroskedasticity-robust standard errors in parentheses. Observations weighted by city sample population in the relevant demographic group.
Table 5: Population Change vs. Employment Changes: Household Leverage as IV

<table>
<thead>
<tr>
<th>Panel A: Men, High-school or less</th>
<th>IV Estimate</th>
<th>Dependent Variable: Proportional Population Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proportional Change in</td>
<td>Foreign-Born</td>
</tr>
<tr>
<td>First Stage</td>
<td>Household Debt-to-Income</td>
<td>-0.082***</td>
</tr>
<tr>
<td>First Stage Partial F-Statistic</td>
<td>51.41</td>
<td>64.63</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Men, Some college or more</th>
<th>IV Estimate</th>
<th>Dependent Variable: Proportional Population Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proportional Change in</td>
<td>Foreign-Born</td>
</tr>
<tr>
<td>First Stage</td>
<td>Household Debt-to-Income</td>
<td>-0.046***</td>
</tr>
<tr>
<td>First Stage Partial F-Statistic</td>
<td>23.85</td>
<td>20.19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel A: Women, High-school or less</th>
<th>IV Estimate</th>
<th>Dependent Variable: Proportional Population Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proportional Change in</td>
<td>Foreign-Born</td>
</tr>
<tr>
<td>First Stage</td>
<td>Household Debt-to-Income</td>
<td>-0.039***</td>
</tr>
<tr>
<td>First Stage Partial F-Statistic</td>
<td>19.91</td>
<td>50.84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Women, Some college or more</th>
<th>IV Estimate</th>
<th>Dependent Variable: Proportional Population Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proportional Change in</td>
<td>Foreign-Born</td>
</tr>
<tr>
<td>First Stage</td>
<td>Household Debt-to-Income</td>
<td>-0.033</td>
</tr>
<tr>
<td>First Stage Partial F-Statistic</td>
<td>17.39</td>
<td>17.73</td>
</tr>
</tbody>
</table>

Each coefficient represents a separate IV regression. All regressions on 98 city observations include an intercept term and controls for enclaves and indicators for state-level immigration policies. Heteroskedasticity-robust standard errors in parentheses. Observations weighted by city sample population in the relevant demographic group.
Table 6: Propensity Score Reweighting of Natives to Match Mexican-Born Observables

<table>
<thead>
<tr>
<th>Panel</th>
<th>Gender</th>
<th>Education</th>
<th>Proportional Change in Employment</th>
<th>Group-Specific Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High-school or less</td>
<td>Native-Born - Reweighted</td>
<td>Mexican-Born</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group-Specific Employment</td>
<td>bivariate</td>
<td>with controls</td>
</tr>
<tr>
<td>Panel A: Men</td>
<td></td>
<td>Proportional Change in</td>
<td>-0.072</td>
<td>-0.079</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group-Specific Employment</td>
<td>(0.148)</td>
<td>(0.146)</td>
</tr>
<tr>
<td>Panel B: Men</td>
<td></td>
<td>Proportional Change in</td>
<td>0.594***</td>
<td>0.567***</td>
</tr>
<tr>
<td></td>
<td>Some college or more</td>
<td>Group-Specific Employment</td>
<td>(0.158)</td>
<td>(0.144)</td>
</tr>
<tr>
<td>Panel A: Women</td>
<td></td>
<td>Proportional Change in</td>
<td>-0.059</td>
<td>-0.119</td>
</tr>
<tr>
<td></td>
<td>High-school or less</td>
<td>Group-Specific Employment</td>
<td>(0.170)</td>
<td>(0.185)</td>
</tr>
<tr>
<td>Panel B: Women</td>
<td></td>
<td>Proportional Change in</td>
<td>0.580***</td>
<td>0.569***</td>
</tr>
<tr>
<td></td>
<td>Some college or more</td>
<td>Group-Specific Employment</td>
<td>(0.190)</td>
<td>(0.159)</td>
</tr>
</tbody>
</table>

Each coefficient represents a separate regression. All regressions on 98 city observations include an intercept term. Those in columns 2 and 4 include additional controls for enclaves and indicators for state-level immigration policies. Native-born observations calculated using propensity score weights to match observables for the Mexican-born sample. See text for details. Heteroskedasticity-robust standard errors in parentheses. Observations weighted by city sample population in the relevant demographic group.
Table 7: Channels of Adjustment in the Change in Mexican-Born Low-Skilled Male Population 2006-2010

<table>
<thead>
<tr>
<th>Total Proportional Change in Mexican-Born Population 2006-2010</th>
<th>Immigrants Arriving 2007 or Later</th>
<th>Immigrants Arriving Prior to 2007</th>
<th>Net Aging In</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Group-Specific Change in Employment</td>
<td>0.566***</td>
<td>0.119***</td>
<td>-0.0117</td>
</tr>
<tr>
<td></td>
<td>(0.137)</td>
<td>(0.0238)</td>
<td>(0.0244)</td>
</tr>
</tbody>
</table>

Each coefficient represents a separate regression. All specifications are run on 98 observations and include an intercept. Columns (2) and (3) partition the result in column (1). The dependent variable in column (4) is constructed by finding the number of individuals likely to have aged in and out the sample in absence of mobility. More details are provided in the text.
A Appendix

A.1 Propensity Score Reweighting

Table A-1 provides the results of the probit used to reweight the native population for the results described in section 3.4. It also provides unweighted means of the included covariates as well as the reweighed means for the native population. Although there are substantial differences in the distribution of these covariates, the reweighting works quite well, with the means for the reweighted natives quite similar to those of the Mexican-born.

Table A-1: Propensity Score Reweighting Details

<table>
<thead>
<tr>
<th></th>
<th>Probit Coefficient</th>
<th>Natives</th>
<th>Mexicans</th>
<th>Reweighted Natives</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Dropout</td>
<td>1.092***</td>
<td>18.0%</td>
<td>61.7%</td>
<td>61.8%</td>
</tr>
<tr>
<td>Married (Spouse Present)</td>
<td>0.296***</td>
<td>48.3%</td>
<td>50.3%</td>
<td>49.0%</td>
</tr>
<tr>
<td>Rent Home</td>
<td>0.459***</td>
<td>32.0%</td>
<td>58.6%</td>
<td>59.4%</td>
</tr>
<tr>
<td>Age</td>
<td>Dummies incl.</td>
<td>40.65</td>
<td>35.88</td>
<td>35.57</td>
</tr>
<tr>
<td>Work in Construction</td>
<td>Not Incl.</td>
<td>19.3%</td>
<td>32.1%</td>
<td>23.2%</td>
</tr>
</tbody>
</table>

Data from 2006 American Community Survey. Sampling criteria maintained from original sample. Reported means are calculated using person-level sampling weights. The reweighting uses propensity scores based on a Probit model (also weighted with person-level weights) that includes dummy variables for high school dropout status, marital status, home ownership, and a dummy for each age. Industry is not used in constructing the propensity score.
### A.2 Main results - Unweighted

Table A-2 provides the results of regressions analogous to Table 2 from specifications that give each city equal weight.

Table A-2: Population Changes and Change in Payroll Employment - Unweighted, Metro Areas 2006-2010

<table>
<thead>
<tr>
<th>Dependent Variable: Proportional Population Change</th>
<th>Foreign-Born</th>
<th>Native-Born</th>
<th>Mexican-Born</th>
<th>Other Foreign-Born</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Men, High-school or less</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportional Change in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Employment</td>
<td>0.959***</td>
<td>0.257**</td>
<td>1.074***</td>
<td>1.973**</td>
</tr>
<tr>
<td></td>
<td>(0.176)</td>
<td>(0.125)</td>
<td>(0.273)</td>
<td>(0.826)</td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.480***</td>
<td>0.167*</td>
<td>0.670***</td>
<td>1.592**</td>
</tr>
<tr>
<td></td>
<td>(0.090)</td>
<td>(0.096)</td>
<td>(0.125)</td>
<td>(0.784)</td>
</tr>
<tr>
<td><strong>Panel B: Men, Some college or more</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportional Change in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Employment</td>
<td>-0.019</td>
<td>0.689***</td>
<td>1.850</td>
<td>0.877</td>
</tr>
<tr>
<td></td>
<td>(0.449)</td>
<td>(0.156)</td>
<td>(3.637)</td>
<td>(0.882)</td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.616*</td>
<td>0.487**</td>
<td>3.115</td>
<td>0.478</td>
</tr>
<tr>
<td></td>
<td>(0.356)</td>
<td>(0.185)</td>
<td>(2.612)</td>
<td>(0.450)</td>
</tr>
<tr>
<td><strong>Panel A: Women, High-school or less</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportional Change in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Employment</td>
<td>0.372</td>
<td>0.224</td>
<td>0.482</td>
<td>0.746</td>
</tr>
<tr>
<td></td>
<td>(0.246)</td>
<td>(0.137)</td>
<td>(0.365)</td>
<td>(1.134)</td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.204</td>
<td>0.206</td>
<td>0.234</td>
<td>-0.727</td>
</tr>
<tr>
<td></td>
<td>(0.212)</td>
<td>(0.143)</td>
<td>(0.352)</td>
<td>(0.733)</td>
</tr>
<tr>
<td><strong>Panel B: Women, Some college or more</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportional Change in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Employment</td>
<td>0.771*</td>
<td>0.324</td>
<td>-1.241</td>
<td>1.510</td>
</tr>
<tr>
<td></td>
<td>(0.418)</td>
<td>(0.128)</td>
<td>(1.608)</td>
<td>(1.127)</td>
</tr>
<tr>
<td>Group-Specific Employment</td>
<td>0.042</td>
<td>0.344</td>
<td>-0.429</td>
<td>0.416</td>
</tr>
<tr>
<td></td>
<td>(0.549)</td>
<td>(0.183)</td>
<td>(0.742)</td>
<td>(0.623)</td>
</tr>
</tbody>
</table>

Each coefficient represents a separate bivariate regression of the proportional population change for the relevant group (from the American Community Survey) on the proportional change in overall employment or group-specific employment (from County Business Patterns data, using the demographic group’s industry mix). CBP estimates include values binned for disclosure reasons. Specifications dropping binned values are similar. All regressions include an intercept term and 98 city observations. Heteroskedasticity-robust standard errors in parentheses.