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Internal Mobility: The Greater Responsiveness of Foreign-Born to Economic Conditions

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Geographic mobility is an important mechanism in determining the spatial distribution of economic activity and local economic growth. From this perspective, mobility happens in response to employment opportunities and differentials in real income (that is, in local earnings relative to local prices). Not all mobility in the United States is driven by economic motives. About 30 percent of the residential mobility is attributed to "family" reasons, such as establishing a new household or changing family status, and about 5 percent to other reasons related to health, climate, and education (Ihrke 2014). Nevertheless, mobility for economic reasons, usually related to jobs and housing, is the stated rationale for the majority of moves. Moreover, this type of mobility plays an important role in spatial convergence of local real income as well as in determining a spatial equilibrium—with population growth occurring where demand for labor grows and population decline occurring where labor demand decreases (Rosen 1979; Roback 1982). It has become a point of concern that the process of regional economic convergence in the US economy seems to have slowed down in the 1980s (Ganong and Shoag 2017), and the economic fortunes of US cities started diverging from each other in wages, employment growth, and productivity (Moretti 2012). Meanwhile, internal geographic mobility seems to be on a declining trend, as well (Molloy, Smith, and Wozniak 2011). While the patterns of regional and urban convergence and divergence are driven by several factors, some local and other global, migration does not seem to be as much of a partially counterbalancing force as it was in the past.

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Our goal in this article is to provide a review of internal mobility in the United States in recent decades, with a focus on the period since 2000 and an emphasis on economically motivated mobility. We first extend and update data on total mobility across US states and labor markets, beginning in 1980, with a focus on the recent period, 2000–2017. We confirm the pattern previously established in this literature of an ongoing decline in mobility, using a combination of data from the American Community Survey, the decennial Census, and the Internal Revenue Service. We then focus on foreign-born individuals and establish that, on average, they do not have total mobility rates higher than natives; in fact, they are somewhat smaller. However, we also identify a dimension over which foreign-born mobility varies substantially: the newly arrived foreign-born with less than ten years in the United States are much more mobile across states and labor markets than natives.

The foreign-born population group is contributing in an important way to the evolution of the spatial distribution of labor in the United States, if for no other reason than because 43 percent of US labor force growth since 2000 has been due to immigrants. But when we dig more deeply, we also observe that geographic mobility of the foreign-born in response to local employment shocks is higher than their proportion in the population. Indeed, during the period 1980–2000, when inflow of new immigrants was large, the foreign-born population responded much more strongly than did the native population to differential employment growth across labor markets. As a consequence, highly successful cities became cities with higher immigrant density by the year 2000. In the period 2000–2017, which includes a deep recession and strong recovery and during which new migration from abroad declined and the long-term immigrants became a more sizeable group, the foreign-born population still responded more than proportionally to local growth in labor demand. This was mainly because cities with large immigrant shares performed better than those with small shares of immigrants, and although the long-term immigrants in the United States were not very mobile, the network effects of previous immigrants implied the continued settlement of new immigrants in those cities.

We review potential explanations for the disproportionate role of foreign-born individuals in the population response to local increases in labor demand—ranging from differential exposure to housing and local prices, to the role of early enclaves and persistent demand shocks, and to their distribution and specialization across occupations. Each of these explanations contributes to our understanding of the special role of foreign-born individuals and their greater propensity to respond to growth in labor demand. We will also suggest some promising and less-explored avenues to understand this phenomenon more fully.

Measures of Total Mobility

To connect with the previous literature on US internal mobility and specifically with patterns presented in this journal by Molloy, Smith, and Wozniak (2011) who provided a consistent series capturing total internal mobility in the United

States from 1980 to 2008, we begin the paper by updating information on interstate and inter-labor market mobility. In particular, we demonstrate that the decline in mobility apparent in earlier work has continued since the Great Recession.

Mobility across States

Figure 1 shows the trends in annual total migration rates across states calculated as the percentage ratio between in-migrants and the resident population in a given year: that is, we focus on people who change their residence between two consecutive years. This measure is the object of analysis in several recent studies of internal mobility in the US economy (Albert and Monras 2018; Amior 2019; Ganong and Shoag 2017; Kaplan and Schulhofer-Wohl 2017).

We rely on three sources for the figure. As a starting point, the American Community Survey has asked directly about annual mobility since the first (experimental) version of the survey was fielded in 2000. The decennial Censuses of 1980, 1990, and 2000 ask about five-year mobility rates, not one-year rates. These questions allow information on origin-destination pairs, at least for US states, and cover the entire US population. Large samples of both decennial Census and American Community Survey data are freely available to researchers through IPUMS (Ruggles et al. 2019). To derive one-year mobility rates using the decennial Census data from 1980 and 1990, we use the ratio between five-year and one-year mobility rates in 2000, a year when the Census Bureau ran both the decennial survey and the first American Community Survey.[1]

Using this data from the decennial Census and the American Community Survey is better than relying on other data sources that have been used to study mobility, like the Current Population Survey (CPS) and its Annual Social and Economic Supplement, for two primary reasons.[2] First, Census and American Community Survey samples are significantly larger than any other data source

[1] The comparison of the 2000 five-year rates from Census and of the one-year rate from the 2000 American Community Survey shows that some people likely move more than once in five years, returning to their home states (or that they have recollection bias in how they answer the survey). In fact, the ratio of the quinquennial to annual migration rates is about 0.71 and is stable across demographic groups. Kaplan and Schulhofer-Wohl (2017), among others, suggest not using the 2000-2004 American Community Survey data, because the sample is smaller and the program was experimental. However, for purposes of documenting the long-term trends in state migration rates, the 2000-2004 American Community Surveys appear reliable. Further details are available in the document accompanying the replication data and programs at the online Appendix available with this article at the *Journal of Economic Perspectives* website.

[2] The Current Population Survey (CPS), and in particular the Annual Social and Economic Supplement (ASEC), while used in several studies, seems less reliable. First, Census and American Community Survey data are based on much larger samples and are cross-sectional in nature, which reduces measurement error and attrition; for example, American Community Survey data cover 1 percent of the US population each year, interviewing about 300,000 thousand participants each month, versus the 60,000 monthly respondents of the CPS. Second, since 1996 the CPS overestimates the decline in interstate migration (due to attrition and imputation) and reports lower levels of internal mobility than other sources (Kaplan and Schulhofer-Wohl 2012). Finally, the CPS has been shown to misreport receipts of government transfer programs (Meyer and Mittag 2019), earnings, and poverty status (Meyer et al. 2019) at an increasing rate over time (Meyer, Mok, and Sullivan 2015): similar concerns may be valid for self-reported migration too.

Figure 1
Interstate Annual Mobility, 1980–2017

Note: The graph represents the population moving across state borders each year as a percentage of the residents in the state of destination. The black dots and the black solid line are constructed using data from decennial Census (1980–1990) and American Community Survey (2000–2017) data, relative to all resident population (excluding those residing in group quarters) and based on the information provided by individuals about their state of residence in the previous and current year. The decennial Census figures have been adjusted from five-year to one-year migration rates according to a correction factor based on the 2000 Census and American Community Survey data, as described in the main text. The grey dashed line is constructed using data from the Internal Revenue Service Statistics of Income (IRS-SOI) calculating the number of tax exemptions that move across state lines in the previous year relative to total tax exemptions' population. The series stops in 2009 because of migration misreporting acknowledged by the IRS-SOI.

available, allowing researchers to study migration patterns for small geographical units such as labor markets, which would be measured with a very significant amount of noise using a much smaller dataset such as the Current Population Survey. Second, the publicly available micro-data from the Census Bureau provide information along many different demographic, economic, and geographic dimensions.

To validate and corroborate the patterns that we identify with the Census data, in Figure 1 we also take advantage of the Internal Revenue Service (IRS) migration statistics, which are freely available from the Statistics of Income website.[3] IRS data

[3]The IRS Statistics of Income website is https://www.irs.gov/statistics/soi-tax-stats-migration-data. The IRS data available on the website cover the period 1990–2018, of which we use 1990–2009. The additional migration data covering the period 1983–1989 were obtained from the IRS. We thank Andrew Foote for his help in locating and using these data.

derive the migration flows from administrative sources and record the change of residence between pairs of counties and pairs of states as reported in the income tax forms filed by residents in two consecutive years. These data only cover tax filers who constitute about 87 percent of US population between 1992 and 2009 (as reported by Molloy, Smith, and Wozniak 2011) and could miss some movers, but they are very consistent over time. It seems plausible that movers in the population of filers likely track movers in the overall population.[4] For Figure 1, the IRS data series is constructed using the total number of tax exemptions who change state in a year as a percentage share of the non-migrating population of the destination state. The IRS Statistics of Income group has acknowledged reliability issues and the existence of migration misreporting from 2010 onwards, which seems to be based on change in the criteria for data collection. As a result, the IRS internal migration data after 2009 are not consistent with the rest of the series, and in Figure 1, we drop those years.

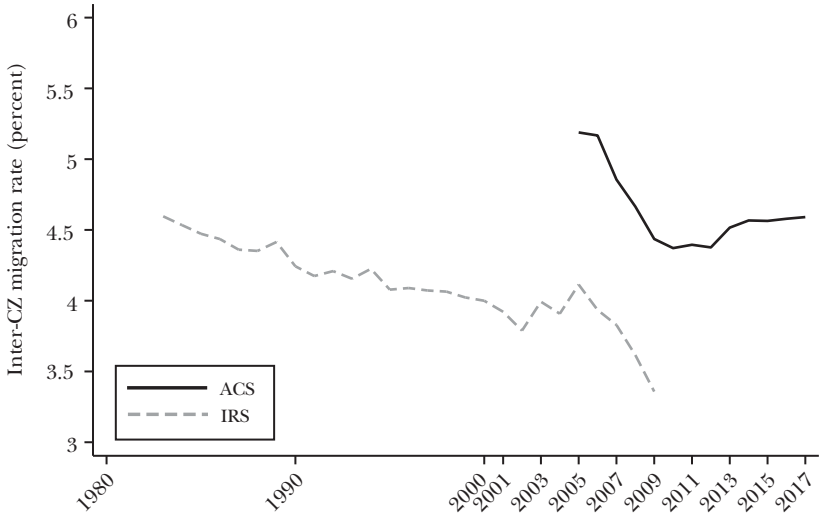
Figure 1 shows two main facts. First, it confirms the long-term decline in interstate migration previously documented by several studies starting with Molloy, Smith, and Wozniak(2011). Between 1980 and 2017, the drop of the migration rate has been around 0.66 percentage points (or totaling about 24 percent of the 1980 value). The decline shown is consistent with what was found already in previous calculations based on similar data. It is not as pronounced, however, as what other studies based on data from the Current Population Survey have found (for example, see Figure 2 in Molloy, Smith, and Wozniak 2011). Second, the IRS and the Census migration-rate series track each other very closely. The gap between the two lines probably exists because the IRS data exclude those who do not file income taxes, who are also known to be somewhat less mobile than tax filers (Molloy, Smith, and Wozniak 2011). However, the difference is small and has not changed much over time. The close correspondence in trends and fluctuations of mobility measures using these two data sources suggests that they are capturing actual trends in the mobility of US citizens. We also notice some fluctuations in yearly mobility post-2000, which seems particularly accentuated in the IRS data and is roughly procyclical, with an increase in mobility pre-2006, a decline 2006–2010, and a recovery in mobility rates after that. These cycles, however, do not seem particularly prominent—especially in the American Community Survey data. The slow but constant decline in state-level mobility over the long run still seems to be the predominant feature of the data.

Mobility across Commuting Zones

Making connections from state-level mobility to economic variables can be tricky. Some urban areas sit astride a state boundary, so it is possible to move one's residence across a state boundary while remaining in the same local labor

[4]Other smaller datasets have been used to study mobility of specific groups. These include, among others, the Federal Reserve Bank of New York Consumer Credit Panel (DeWaard, Johnson, and Whitaker 2019), the National Longitudinal Survey of Youth, and the Survey of Income and Program Participation SIPP (Johnson and Schulhofer-Wohl 2019).

Figure 2
Inter-Commuting Zone Annual Mobility, 1980–2017



Note: The graph represents the population moving across commuting zone borders each year as a percentage of the residents in the commuting zone of destination between 1980 and 2017. The black solid line is constructed from American Community Survey data: it includes the whole US resident population (excluding those residing in group quarters) and is based on the information provided by individuals about their PUMA of residence in the previous and current year (which are matched to commuting zones of residence following the procedure of Autor and Dorn 2013). The grey solid line is constructed from the Internal Revenue Service Statistics of Income data. The series is based on the number of tax exemptions who move across counties in the previous year relative to total population of tax exemptions in the county of destination (then aggregated to commuting zone). Commuting zones are identifiable in American Community Survey data only in the years 2005–2017; the IRS series stops in 2009 because of migration misreporting acknowledged by the IRS-SOI.

market—or even the same job. In general, state-level economic statistics are likely to be an imperfect proxy for local labor markets. Figure 2 shows the total mobility rate across *commuting zones*, which have the desirable feature of proxying for self-contained local labor markets (Tolbert and Sizer 1996; Autor and Dorn 2013). As a result, migration rates between commuting zones should better capture labor demand-driven mobility as well as mobility in response to economic shocks, rather than changes of residence due to change in family status or transitions in family life (for critical discussions of the definition of local labor markets, see Monte, Redding, and Rossi-Hansberg 2018; Manning and Petrongolo 2017). In Figure 2, this mobility rate is calculated, mirroring the definition for state-mobility as those people moving into commuting zones in a given year as a percentage of the non-migrating population in the destination commuting zone.

However, measuring migration between commuting zones presents several challenges, as they are not directly observed in the Census Bureau data or in the

IRS data. For the American Community Survey line shown in Figure 2, we follow Autor and Dorn (2013) and start with the Public Use Microdata Areas (PUMAs), the smallest geographical unit available in the American Community Survey. These are geographically contiguous groups of at least 100,000 people, built by combining Census tracts and counties. The PUMAs data is available from the American Community Survey starting in 2005. We build a probabilistic match between PUMAs and the commuting zone to which they belong. We can then measure movements between commuting zones at a one-year interval.

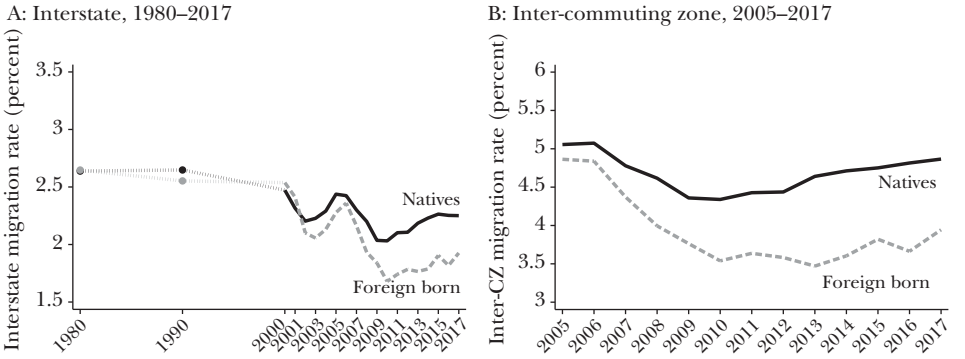
In the IRS data, locations are available at the county level, so we instead aggregate county-to-county flows into commuting zone flows. To do this, we aggregate total county in-migration flows at the commuting zone level and we subtract those coming from other counties within the same commuting zone. The IRS does not report flows below 10 units, so we need to make an assumption on those county-to-county flows that are undisclosed: in particular, we attribute them to be flows from outside the commuting zone of interest.[5]

Given that these calculations have the possibility of introducing measurement error, it is reassuring to see that the estimated migration rates in Figure 2 have similar behavior over time as those reported in Figure 1. For example, the annual rate of total inter-commuting zone migration as measured by IRS data was about 4.5 percent in early 1980s, slowly declining to around 3.5 percent in 2009. The IRS and American Community Survey series trend similarly between 2005 and 2009. Migration rate had a local peak around 2005 and then declined—by 0.8 percentage points—to the lowest level in the twelve-year period of the American Community Survey data in 2010. This is a significant decline, equal to a reduction by about one-sixth of the 2005 mobility. In the 2005–2010 period, the cross-state mobility declined by 0.4 percentage points, which also represents between one-fifth and one-sixth of the 2005 mobility. Mobility has recovered since then, although it is still below the 2005 level. Overall, while the decline in labor-market and cross-state mobility was substantial during the Great Recession, the following recovery of mobility puts the recent values in line with a continued long and slow decline in internal mobility since 1980 that affected equally long- and short-range movements.[6]

[5]Additional details are available in the accompanying Data Appendix that includes replication data and programs.

[6]Another way to measure total internal mobility is to look at lifetime interstate migration for population in working age. This can be observed in Census data by comparing state of residence and state of birth for individual in working age (that is, 15–64 years old). The Census has gathered the data necessary to calculate this mobility rate since before 1900. However, this measure is rather coarse: it does not account for when the migration occurred or for how many times a person moved in a lifetime, and it treats migration and return as no migration at all. However, this measure is qualitatively similar to the other findings: that is, the share of people who moved across states during their lifetimes increased at a slow pace until 1990, stabilized, and has slowly declined since 2000. In the most recent period, lifetime migration went from 32.0 percent in 2005 to 31.6 in 2017. For details and a figure, see the online Appendix (Figure A1) available with this article at the *Journal of Economic Perspectives* website.

Figure 3
Interstate and Inter-Commuting Zone Annual Mobility, US Natives and Foreign-Born Individuals



Note: Panel A shows the immigration rates across state borders as a percent of the state resident population: black dots for decennial Census 1980 and 1990, and black solid line for American Community Survey 2000–2017, indicates for US natives; grey dots for decennial Census 1980 and 1990, and grey dashed line for American Community Survey 2000–2017, indicates foreign-born residents of the United States. Panel B shows the immigration rates across commuting zone borders as a percent of the commuting zone resident population, separating US natives (black solid line) and foreign-born residents (grey dashed line).

Demographic and Foreign-Born Patterns of Mobility

The data from the American Community Survey allow us to focus on mobility patterns of different demographic groups. We first use it to show the difference in mobility between natives and foreign-born individuals and its evolution over time. Then we decompose mobility across groups to see the extent to which the different demographic composition of natives and immigrants can explain differences in their internal mobility, and its changes over time.

Panels A and B of Figure 3 were created using the same methods as Figures 1 and 2 and show that interstate and inter-commuting-zone mobility of natives and immigrants was similar in the period 1980–2000. After that, total foreign-born mobility seems to have declined relative to that of natives, starting in the period 2006–2010, roughly coinciding with the Great Recession. Part of this trend could be due to the drop of foreign-born arrivals from abroad, which declined from 3.5 percent of the foreign-born population in the period 2000–2007 to 2.8 percent in the period 2008–2017 (see last row of Table 1). Moreover, by comparing Figures 1 and 2 with Figure 3 panels A and B, we can see that foreign-born individuals did not affect total mobility much up to 2005, as the mobility rate of natives was very similar to overall mobility. After 2010, immigrants slightly contributed to reduce overall mobility, as in 2017, cross-state mobility of natives was about –0.1 percentage points lower than overall mobility including immigrants.

Table 1

Annual Total Migration Rates across States by Demographic Group: Natives and Foreign Born *(percent)*

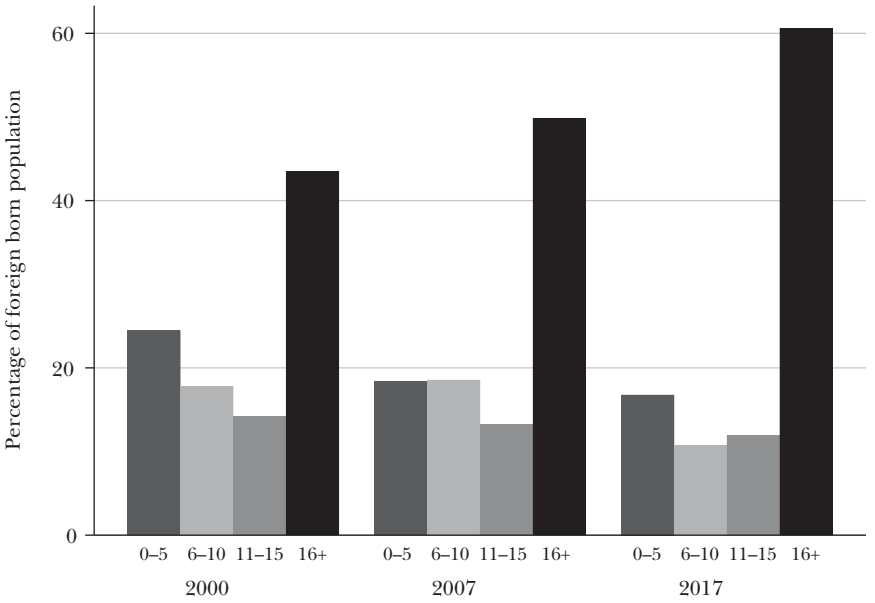
		2000–2007		*2008–2017*	
Group		*Natives*	*Foreign born*	*Natives*	*Foreign born*
Gender	*Male*	2.43	2.49	2.18	2.02
	Female	2.30	2.20	2.10	1.82
Age	*<25*	2.72	3.06	2.38	2.75
	25-44	3.22	2.94	3.16	2.6
	45-64	1.49	1.40	1.40	1.11
	65+	1.12	1.03	1.14	0.94
Race	*Other*	2.33	2.60	2.04	2.17
	White	2.37	2.09	2.17	1.66
Education	*HS*	1.87	1.85	1.66	1.33
	College	3.00	3.07	2.66	2.62
Years since arrival	*0–5*		3.95		4.03
	6–10		2.55		2.38
	11–15		2.07		1.75
	16+		1.71		1.34
Overall		2.36	2.35	2.14	1.92
One-year immigration from abroad		0.20	3.48	0.23	2.76

Source: Author's calculations based on American Community Survey data
Note: Annual total migration rates across states are calculated as the percentage ratio between in-migrants and the resident population in a given year: that is, we focus on people who change their residence between two consecutive years. The sample is composed of the US population excluding group quarter residents. Annual interstate mobility is the percent of people in each group crossing state borders in the previous year as a percent of the population of that group resident in the destination state in the previous year. In the last row, one-year immigration from abroad indicates immigration by natives and foreign-born individuals who were residing abroad in the previous year to the United States.

To see whether different demographic characteristics of immigrants and natives may explain their different recent mobility rates, Table 1 shows the differences in interstate mobility of foreign-born individuals and natives separately for several demographic groups. We report average annual mobility in the 2000–2007 period, before the Great Recession and in the 2007–2017 period that includes the Great Recession and the recovery.

Several patterns emerge from this table. First, mobility declined between the earlier and later period by about 0.2 percentage points for natives, and by 0.4 percentage points for foreign-born individuals. These changes were widespread by age, race, and education, for both immigrants and natives. Second, mobility of natives was slightly higher than foreign-born mobility on average in most groups, and this difference increased somewhat in the later period as foreign-born individuals became less mobile. Third, there are few exceptions: individuals below age 25 and who are low educated (high school and less) are more mobile for the foreign-born group than for natives.

Figure 4
Foreign-Born Residents, Distribution by Years since First Arrival in the United States



Note: Authors' calculations on 2000, 2007, and 2017 American Community Survey data, based on the reported years of residence in the United States (foreign born only). The four categories indicate respectively: 0 to 5, 6 to 10, 11 to 15, and 16 or more years of residence.

In addition, interstate mobility among foreign-born individuals is highly differentiated according to the number of years the individuals have resided in the United States, as shown near the bottom of Table 1. For example, the group that arrived in the previous five years has an incredibly high cross-state mobility rate (about 4 percent) in both the earlier and later period. This implies that newly arrived immigrants are more likely to follow opportunities and relocate, thus taking advantage of the fact that they have not yet laid down roots in a place and that they have social and human capital that is not specific to their first location. Recent flows of immigrants from abroad, therefore, are likely to represent the population most responsive to economic opportunities, both in the first move when they arrive and in a possible second move within a few years.

A decline in arrivals of new immigrants may have contributed to the decline in average mobility of immigrants. Figure 4 provides evidence on this significant change in the foreign-born population from 2000–2017: the share of foreign-born individuals who arrived more recently is falling, while the share of foreign-born individuals who have been in the United States for a longer period has risen.

Our calculations from the American Community Survey suggest that 16.8 percent of the foreign-born population in 2017 had arrived in the previous five years, while 24.5 percent of foreign-born individuals had arrived in the five years previous to 2000. Such a significant change in composition, which may also be correlated with the aging of immigrants, contributes significantly to the declining internal migration rate seen among the foreign-born.

To investigate the role of demographic compositional change among natives and foreign-born individuals, we perform a Blinder-Oaxaca decomposition to explain the decline of total mobility between 2000 and 2017.[7] This exercise decomposes the change in interstate mobility of natives and foreign-born individuals into a part due to the change of mobility for each demographic group and a part attributable to the changing shares of demographic groups in the population. We focus on individuals aged 25 to 64 who are not in school. For the period 2000–2007, demographic composition explains little to none of the change in migration patterns for both immigrants and natives. For the 2007–2017 period, changes in demographic composition taken alone would actually predict an increase (rather than the observed decrease) in migration rates for both natives and foreign-born individuals, and thus makes the observed decrease in mobility stand out even more.

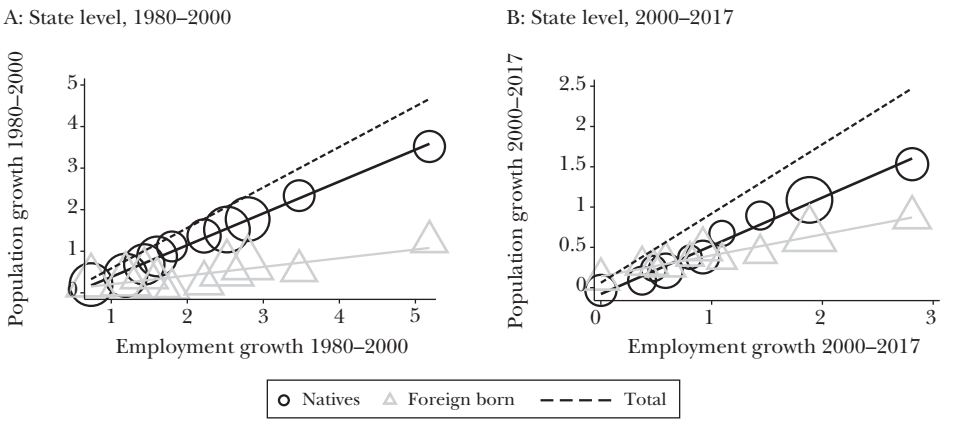
Focusing on foreign-born individuals who experienced the relatively larger decline in mobility, a decomposition based only on length of stay in the United States shows that about one-quarter of the mobility declines in the period 2000–2007 and one-half in the 2007–2017 period is due to the declining share of immigrants recently arrived (that is, in the last ten years), along with the increasing share of individuals who have been in the United States for more than 16 years.

The Responsiveness of Mobility to Local Employment Growth

Except for higher total mobility among recently arrived foreign-born individuals, total mobility seems relatively similar between foreign-born individuals and natives. Both groups show a continuing trend of declining total mobility. However, the picture changes when we look at moves in which people leave places where labor demand (and hence employment) is declining, and conversely, move toward places where labor demand is growing. That foreign-born people contributed very significantly to the population response to local labor demand shocks, improving the functioning of local markets, was previously observed by Borjas (2001). Recently, this role of foreign-born individuals in local labor markets has gained renewed attention in relation to both short-run and long-run adjustments: for US evidence, see Cadena and Kovak (2016) and Amior (2019); for European evidence, see Basso, D'Amuri, and Peri (2019).

[7] Detailed results of the decomposition are in the online Appendix available with this paper at the *Journal of Economic Perspectives* website.

Figure 5
Population Change and Employment Growth, Yearly Average *(percent)*



Note: The graphs show the average annual change in the native population and foreign-born population, as percentage of the total initial population, in response to the average annual percentage change of total employment in US states. The scatter represents the average mobility in each of ten deciles of employment growth and the size of the bubble is proportional to the sum of the state population in each decile at the beginning of the period. The regression lines represent the linear relationship between the change in the total (dark-dashed), native (dark solid) and foreign-born (light solid) population as percent of initial total population, and the change in total state employment in each period. The sample is composed of 25–64 year-olds not enrolled in school and not residing in group quarters. Panel A reports these figures for the period 1980–2000 using decennial Census data and Panel B for the period 2000–2017 using the 2000 decennial Census and the 2001–2017 American Community Survey data.

Figure 5 shows the relationship between population change (vertical axis) and employment growth (horizontal axis) based on state-level U.S. data. A coefficient of one—shown by the dashed line in the two panels—would imply that employment changes, likely driven by local labor demand changes, were fully accompanied by changes in the specific population of similar magnitudes, leaving the employment-population ratio unchanged. A coefficient of zero, on the other hand, would imply no net population changes and only changes in local employment-population ratios in response to employment shocks. Analyzing the relationship between total population change and total employment change illustrates the extent to which employment changes were associated in aggregate with net inflows or outflows of people. Using this approach, and separating the US resident population into foreign-born and natives, we can see which part of the total population adjustment is driven by changes in natives and which part by changes in the foreign-born population.

One way to represent local population adjustment due to a specific group, associated with changes in local labor demand, is to plot changes in that population as a percent of the initial total population versus percentage changes in employment in the same geographic units. While for simplicity we only show a correlation, empirical evidence by Cadena and Kovak (2016) during the Great Recession and

by Amior (2019) for the long-run—which include controls and exploit variation of sector-specific shocks to better isolate demand factors—find estimates consistent with our basic results.

More specifically, Figure 5 divides the states into deciles based on the growth rate of employment in the period 1980–2000 in Panel A, and in the period 2000–2017 in Panel B. In each panel, we show the correlation line for the percentage change in total population versus percentage employment growth as a dark dashed line. We also show the change in native population as a percentage of the total, represented by the round circles and continuous black line, and changes in the foreign-born population as a percentage of the total, represented by the triangles and the grey line. Each circle or triangle represents a group of five states, binned into the same decile of the employment growth distribution. The slope of the line represents the association of population growth with employment growth, and the sum of the slopes for the native and foreign-born populations equals the slope of the total population response.

Considering the changes across states, represented in Panel A of Figure 5, we see that the overall population responded essentially one-for-one to employment during the 1980–2000 period: the estimate of that slope is equal to 1.01.[8] Analyzing the contribution of each group, 73 percent of population adjustment in response to employment changes was due to natives, and 27 percent was due to foreign-born individuals. Only about 11 percent of the population was foreign-born during this period, and the foreign-born population accounted for 10.8 percent of total interstate annual mobility. Thus, about one-fourth of state-level population adjustment in response to employment changes was due to foreign-born internal migration in the period 1980–2000 when the foreign-born represented only one-tenth of the US population and of total interstate mobility. This implies that the foreign-born population was about 2.5 times more responsive than the native population in moving to locations experiencing positive economic shocks and away from those experiencing negative economic shocks.

Evidence from the period 2000–2017 confirms the main features described for 1980–2000 but with an additional twist. In Panel B of Figure 5, the overall population response to employment changes decreased somewhat in this period relative to 1980–2000, so that only 86 percent (rather than 101 percent, as in 1980–2000) of the employment change was adjusted by population changes. During this period, the share of foreign-born population increased to about 17 percent and the foreign-born share of total interstate mobility was around 16 percent. The foreign-born population contribution to the local employment growth response represented 36 percent of the total population adjustment—again, more than twice

[8] Table A2 in the online Appendix, available with this article at the *Journal of Economic Perspectives* website, shows the estimates of the slopes, capturing the population change associated to employment changes, and additional details of data and regression results presented throughout this discussion of Figure 5. Notice also that the regression includes an intercept allowing the average national population growth rate and the average national employment growth rate to be different. Both in 1980–2000 and in 2000–2017 employment of 25–64 years old grew faster than population and the national employment/population ratio increased nationally. This does not affect the cross-state estimates of these slopes.

the population share of the foreign-born population. In the 2000–2017 period, which included a deep recession and recovery, the mobility of natives associated with employment shocks decreased, while the population response of immigrants remained as strong as in the previous decades. This implies that as the foreign-born population share also grew, they became responsible for more than one-third of the local population adjustment across US states associated with employment changes.

The correlations shown in Figure 5 continue to hold if we add various controls: the past economic conditions of a location, such as the employment/population ratio at the beginning of the period (as in Amior 2019) and if we consider yearly or long-run changes over decades. Basso, Peri, and Rahman (2017) analyze the difference in mobility between native and foreign-born individuals in response to a more direct measure of labor productivity shocks (related to the adoption of computers). They also find a larger response of foreign-born population relative to native population, when looking at the period 1980–2010, especially among less educated individuals. Their evidence implies that the share of population adjustment of foreign-born individuals in response to local employment changes was two times larger than their share of the overall population.

This greater propensity of foreign-born individuals to move toward areas with increasing employment growth is particularly interesting if we add two qualifications that have been emphasized in the literature. First, the largest difference in mobility is between less-educated (say, non-college educated) native and foreign-born individuals (Cadena and Kovak 2016). While college-educated natives and foreign-born individuals have greater and similar mobility in response to employment growth, the population of non-college educated natives has become much less responsive over time to employment growth, while foreign-born, non-college educated individuals were and remained quite responsive to it.

Second, the tendency of less-educated natives to become less mobile in response to employment and wage opportunities across locations is a trend that has continued for the last several decades. Ganong and Shoag (2017) show that net mobility of less-educated individuals into high-income locations in 1935–1940 was positive and much greater than in 1995–2000, when the less-educated (differently from the more-educated) did not exhibit any tendency to move towards high-income locations (see their Figures 4 and 5). They attribute a large part of the decline among the less-educated in their tendency to move toward employment and wage opportunities to the change in local prices (especially for housing) that in many successful locations increased substantially. In their argument, the higher local prices more than offset the income gains available to the less-educated, but not for the more highly educated, whose share of income spent on housing was smaller. Moreover, they connect the disproportionate increase in housing prices in many successful and desirable locations with restrictions to housing supply caused by regulation and natural constraints and argue that such regulations are a large hurdle to mobility, especially for the less-educated, and hence are a hurdle to convergence of wages/income across locations.

An important corollary to the decline in the mobility of the less-educated toward wages and jobs relative to the highly educated is that economically successful

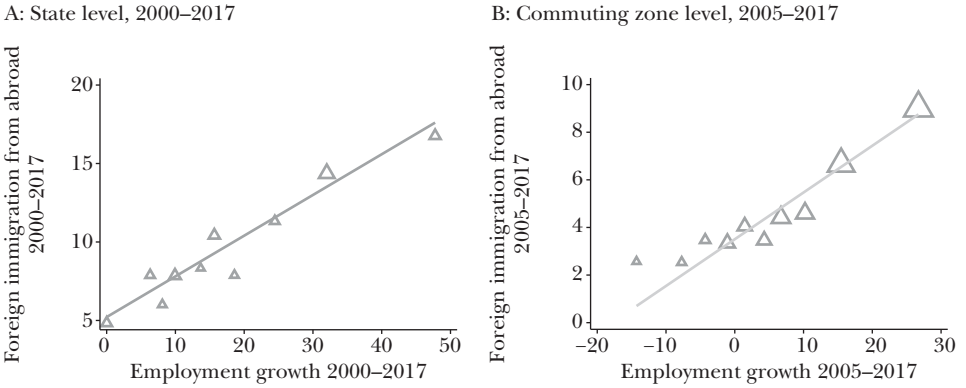
cities and regions—those where employment opportunities and wages grew—have become places with higher concentrations (or shares) of highly educated individuals. This fact has deep economic consequences, which have been recognized and studied by several urban economists and particularly emphasized by Moretti (2012, 2013). Economically successful cities attract more highly educated individuals and this, in turn, feeds their economic success, creating further innovation and productivity growth. At the same time, this dynamic increases housing prices in those locations, especially in many highly successful cities such as New York, Seattle, and San Francisco where housing regulations do not allow an expansion of the housing stock. This high price of housing contributes to keeping out the less-educated. At the same time, higher concentrations of college-educated people may contribute to increasing local amenities (such as quality of schooling, art, or variety of consumption) that are especially valued by college-educated individuals relative to non-college educated individuals (Diamond 2016). This further enhances the cycle, attracting the highly educated more than the less-educated.

There is an interesting implication of the facts presented above. Highly populated and successful cities have increased their density (share) of both foreign-born individuals and highly educated natives (Peri 2016). Albert and Monras (2018) show that the elasticity of immigrant share to population density across cities is positive, very significant, and increased during the period 1980–2010 when, as we show above, the foreign-born population responded significantly more to employment growth. Highly successful cities where wages and population density, local prices, and housing values are high, were places where, especially in the 1980–2000 period (but also in the 2000–2017 period), employment grew faster and the share of foreign-born individuals increased, including those with low levels of education.

Why were foreign-born individuals much more willing than natives to move to fast-growing, higher-wage, but increasingly also more expensive labor markets during the last four decades? Before addressing this question, let us note one additional important fact. A significant part of the mobility of foreign-born individuals to fast-growing labor markets comes from recently arrived immigrants (Amior 2019; Cadena and Kovak 2016). In particular, the first location of immigrants upon arrival from abroad as well as their early relocations within the first five years since migration (when foreign-born individuals exhibit an extremely high *total* mobility as shown in Table 1) account for the largest part of foreign-born mobility to locations with higher employment growth.

Figure 6 shows the correlation between foreign-born cumulated new immigrant arrivals from abroad as a share of the initial population and local employment growth, with Panel A showing mobility at the state level from 2000–2017 and Panel B showing mobility at the commuting-zone level for 2005–2017. Again, employment growth is on the horizontal axis. However, the vertical axes now measures the immigration rate only of newly arrived foreign-born individuals—that is, those coming directly from a residence abroad who were not residing before in the United States over the full period (not the population growth of the foreign-born as in the earlier Figure 5). Again, the triangles represent five states each, grouped by decile of employment

Figure 6
New Immigrant Arrival Rate and Employment Growth, Cumulative *(percent)*



Note: The graphs show the cumulated 1-year new immigration rate (in percent of the base year population) of foreign-born population at the state-level over the period 2000–2017 (Panel A) and at the commuting zone level over the period 2005–2017 (Panel B). On the *x* axis there is the area employment growth over the relative period in percent. The scatter represents the average immigration in each of ten deciles of employment growth and the size of the triangle is proportional to the sum of the state population in each decile at the beginning of the period. The regression lines represent the linear relationship between the cumulative new immigration rate and the change in total state employment in each period. The sample is composed of 25–64 year-olds not enrolled in school and not residing in group quarters and is drawn from the 2000 decennial Census and the 2001–2017 American Community Survey data.

growth, with the size of the triangle proportional to the population of that group. We see a positive and very significant correlation that implies a net increase in the inflow of newly arrived immigrants of .26 percentage points for each 1 percent increase in state employment growth. The mean increase in state-level employment during this time period (about 17 percent) would move a state from the median to the seventy-fifth percentile of the immigration rate of newly arrived immigrants (coming directly from abroad). Similarly, a 1 percent growth in employment at the commuting zone level was associated with a .25 percentage point increase in immigration rate of newly arrived immigrants. In spite of relatively small inflows of new immigrants from abroad in the more recent period considered—and especially in the period 2006–2010 during the Great Recession (Cadena and Kovak 2016)—new foreign-born migration was quite significant in response to local employment growth.

What Explains the High Responsiveness of Foreign-Born Mobility to Economic Conditions?

What can explain the much larger migration of the foreign-born toward fast-growing but dense and expensive local labor markets, vis-à-vis natives? Can we associate it with some features and choices that systematically differentiate

foreign-born individuals from natives? We provide five different potential explanations listed according to our assessment of their importance.

The first explanation is strictly connected to the role played by local prices (especially of housing) and their steep increases in reducing the real gains of less-educated workers in booming cities (Ganong and Shoag 2017). This explanation, proposed by Albert and Monras (2018), focuses on the idea that because foreign-born people plan to spend significant shares of their permanent income in their countries of origin rather than where they live—in the form of remittances, transfers to families, and future consumption there if or when they return—they face an effective "price index" which is less sensitive to local prices. In support of this theory, Albert and Monras show that foreign-born people from countries with lower price indices are more likely to live in high-wage, high-price locations in the United States. They also show that more recent immigrants who have higher probabilities of return and higher shares of income remitted to their countries of origin are also more likely to live in high-wage, high-cost cities.

We would add a variation to this explanation: foreign-born individuals may be less sensitive to local housing prices because they consume less housing in terms of space and quality. The foreign-born may be more used to dense living arrangements in their countries of origin or more used sharing a housing unit with extended families, if needed. Padovani (2018) shows that foreign-born (but not native) households have higher densities of persons per room in dwellings in high-price cities relative to low-price cities. Another explanation based on housing markets may help rationalize the higher propensity of recent migrants to leave locations that show economic decline. A decline in the local housing market, generating negative equity value in a house, can make homeowners less likely to move (for example, Ferreira, Gyourko, and Tracy 2010). However, immigrants, especially those recently arrived, are much less likely to be homeowners and hence are much less likely to be caught in a negative-equity trap. The housing equity channel may explain some decline in mobility in the Great Recession and some differences between natives and immigrants during that period. However, the explanation does not seem important in explaining the long-term decline in native mobility (Winkler 2011; Molloy, Smith, and Wozniak 2011) and may only be marginally important in accounting for differences in the differential mobility of foreign-born individuals.

The second explanation focuses on the well-known tendency of new immigrants to locate where previously established communities of immigrants from the same country are already established. This "enclave" theory (Card 2001) suggests that the location of foreign-born individuals by nationality is persistent over time. In order for this tendency to produce migration of newly arrived immigrants toward more economically successful cities during the 1990s and 2000s, it must be the case that early immigrants—say, those who arrived in the United States in the 1970s and 1980s—had previously located in these cities. Amior (2019) argues for this explanation. He emphasizes that demand shocks for labor are persistent over time and hence a strong response of immigrants to local economic success in the early years is positively correlated with employment shocks in the following decades.

This explanation seems consistent with some basic correlations in our sample for the period 2000–2017, but much less so in the 1980–2000 period. In particular, during the 1980–2000 period, the excess population adjustment of foreign-born persons (shown in the previous section) derived from a much higher elasticity of own-population response of the foreign-born population to local employment changes relative to natives. Essentially, in these early decades of large international migration, new immigrants were very responsive to local employment growth. We estimate an elasticity of own population to employment of about 4 for the foreign-born vis-à-vis an elasticity of only 0.8 for natives. Before this period, the shares of immigrants in US labor markets were small, as immigration was low in the 1960s and 1970s. Hence, as demand shocks affected cities and states differentially, the newly arrived migrants of the 1980s and 1990s were very responsive to them and created new "enclaves" of immigrants across the United States.

Then, in the period 2000–2017, when some cities had reached high densities of immigrants while other had not, the disproportionate role of foreign-born population growth in response to employment growth was actually due to a significant positive correlation between the share of immigrants in 2000 and the subsequent employment growth. While during this period, the own-population elasticity of the foreign-born to employment became similar to that of natives and rather small, the constituted immigrants' enclaves both attracted new immigrants and were also the locations with more significant economic success and employment growth in the 2000–2017 period. Whether the correlation across labor markets of the foreign-born share in 2000 and employment growth in 2000–2017 was only due to the persistence of employment shocks, or whether immigrants contributed to it, by promoting productivity gains or innovation as argued in Kerr and Lincoln (2010) and Peri (2012), it should be a subject of further investigation. Here, we only capture a correlation between the earlier location of immigrants and later employment growth across states. Each one percentage point greater share of the immigrant population in 2000 was associated with 0.7 percent faster employment growth over the 2000–2017 period.

The third explanation is based on a key difference in the type of jobs (occupations) taken by foreign-born individuals and natives. In particular, foreign-born individuals—especially those who have recently arrived—are much less likely to be in occupations where licensing is important, such as real estate brokers, pharmacists, physical therapists, physicians, or electricians. Cassidy and Dacass (2019) show that immigrants are much less likely to be licensed than natives. Johnson and Kleiner (2017) show that occupations with state-specific licensing inhibit interstate mobility significantly. Using data from 2005 to 2015, they show that people in occupations with state-specific licensing had a probability of interstate mobility 32 percent lower than people in occupations with no licensing requirements. Hence, the state-specificity of licensing may contribute to reduce the responsiveness of natives, who are more likely to be employed in licensed occupations, to out-of-state employment growth. Foreign-born individuals, however, are less affected as they are less likely to be in

such occupations. Occupations with very high share of licensed workers such as firefighters and paramedics (67 percent and 80 percent of which are licensed) tend to have a low share of the foreign-born among them (3.5 and 5.3 percent respectively). To the contrary, occupations such as drywall installers and housekeepers, with only 3 percent of the group licensed, include 60 and 52 percent of immigrants among them, respectively.[9] This explanation, however, does not seem specific to a greater proportion of foreign-born moves directed to high-income/high-price cities, nor should it affect much mobility within a state. Moreover, licensing should not affect less-educated natives more than highly educated ones, as being employed in occupations which heavily rely on licensing is more common among college-educated than among non-college-educated individuals.

A fourth explanation, not yet carefully explored, is also related to the different occupations of natives and foreign-born individuals, but along a different dimension. Recent technological evolutions have increased the creation of high-skilled, cognitive-intensive jobs, but also of manual, non-routine jobs, while reducing the creation of routine-intensive types of jobs (Autor 2019). Those manual non-routine jobs (in personal service, construction, house services) have been taken in large part by immigrants (Basso, Peri, and Rahman 2017; Mandelman and Zlate 2016). Newly arrived, low-skilled foreign-born individuals may have comparative advantages in those manual jobs for several reasons: their language proficiency is limited (Peri and Sparber 2009) and they may have more tolerance and less distaste for such jobs, as a consequence of the higher status of these jobs in their countries of origin. If those manual and non-routine jobs were disproportionally created in dense, high-income areas, where technology and high-income consumers generate demand for them, this could explain the higher demand for recently arrived foreign-born people in those areas.

Finally, internal mobility in the United States may have decreased because of a decline in geographic specificity of earnings for skills (or occupations) and because of an improvement in workers' ability to learn about economic returns in a location before moving, hence reducing multiple migration (Kaplan and Schulhofer-Wohl 2017). One might argue that because of higher uncertainty in evaluating the skills of the foreign-born, and because the foreign-born have less information about local opportunities, multiple migration might be expected to be greater for this group. Such an explanation, however, seems more suitable to explain a difference in overall mobility, as some lack of information may generate random mobility rather than mobility in response to economic differences across labor markets. It can, however, help us understand the initially high total mobility

[9] In the online Appendix, Figure A2 shows the correlation between the share of people licensed and the share of foreign-born people across state-occupation cells in year 2016. The scatterplot shows the share of foreign-born persons in state-occupation cells on the vertical axis against the share of the licensed workforce on the horizontal axis, ranked from lowest to highest licensing share and binned into cells each including 5 percent of observations. We see a strong negative correlation with a much higher presence of foreign-born people in cells with less than 20 percent of licensed workers. We thank Joshua Grelewicz for making his data on licensing and foreign-born persons available to us and for assisting us in using them.

of recently arrived immigrants relative to long-term residents, as uncertainty and a lack of information is more severe in the initial period after arrival to the United States. Recently arrived immigrants can also be more mobile as they have less social connections and less location-specific social and human capital, which makes it less costly for them to move again.

Consequences and Policy Discussion

Whatever the reasons for the high mobility of foreign-born individuals in response to local economic shocks, we conclude this essay by looking at the implications for the native-born, and particularly what policy considerations arise in light of these consequences.

First, high mobility of the foreign-born in response to local economic shocks is beneficial to the native-born as a group. Whether it ensures greater local employment adjustment (as argued in Cadena and Kovak 2016) and therefore reduces wage fluctuations for natives in response to shocks, or whether it simply replaces native mobility, allowing natives to avoid moving and displacement costs during economic downturns (as argued by Amior 2019), foreign-born individuals constitute a "buffer" that reduces adjustment costs to labor demand shocks for natives and ease the burden of short-run adjustment for natives.

Second, the higher propensity of foreign-born individuals to move to more productive, more expensive cities increases the overall efficiency of labor allocation in the United States (as also shown by Albert and Monras 2018). In short, it moves productive resources of people and their labor to cities where productivity is higher. On the other hand, when foreign-born individuals help to provide manual services that high-income cities need, it may also provide those cities with a means to lower the cost of non-tradable services without removing housing regulations. In turn, however, this may contribute to the crowding out of some less-educated natives from those cities.

In light of these consequences for natives, we think three immigration policies may potentially enhance the positive effects of immigrants on native welfare. First, because the flow of new immigrants is responsive to employment changes in US labor markets, we could consider making immigration quotas more responsive to US employment cycles. This would increase the aggregate US immigration in periods of high employment growth and reduce it at other times, working as an aggregate adjustment mechanism. Second, as the foreign-born concentrate in high-productivity/high-price cities, increasing their income but also contributing to the crowding of some local services (like schools), it may be prudent to transfer some of the federal income tax gains from foreign-born workers back to those cities to be invested in local services.

Finally, because large, dense, and highly productive cities attract a much larger share of foreign-born individuals than do other places and are thus more affected by immigration than other cities, it seems sensible that the governments of those

cities (perhaps via their mayors) should have more prominent input into federal immigration policies. For example, these mayors may have useful input on issues like the prioritization of enforcement, incentives, and requirements for entry and rules on the number and types of immigrants. As immigrants—especially newly arrived ones—play a very important role in how local labor markets respond to labor demand shocks, local and regional considerations should play a more explicit role in national immigration policies.

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