Do Immigrant Inflows Lead to Native Outflows?

By David Card and John DiNardo*

The rise in immigration that followed the lifting of national-origin quotas in 1965 has led to significant changes in the size and composition of the U.S. population. Despite the presumption that increases in immigration will necessarily harm the labor-market opportunities of natives, most studies over the past decade have found only very modest effects. The usual approach in this literature, the so-called "area-analysis" method, is to correlate wage levels in different metropolitan areas (or changes in these wage levels) with the fraction of immigrants in the metropolitan area.[1] Point estimates from these studies suggest that a 10-percent increase in the fraction of immigrants lowers native wages by no more than 1 percent. These findings are also consistent with the "natural experiment" provided by Miami's experience following the 1980 Mariel Boatlift: despite a rapid increase in low-skilled workers, there was no discernable effect on the wages of less-skilled natives (Card, 1990).

Recent work by Borjas et al. (1996, 1997), however, has been critical of these analyses. Borjas et al. argue that a core assumption of these studies, that immigration leads to an increase in the supply of labor in local labor market, is violated. Specifically, they argue that selective out-migration by natives has effectively "undone" recent immigrant inflows. They note that, if the arrival of one immigrant (of a given skill type) to a local labor market leads one native (of the same skill type) to leave the local market, standard economic reasoning suggests that immigrant inflows will have no detectable impact on local wage differentials: natives have effectively "arbitraged" them away (although immigration might still have important economy-wide impacts).

Evidence of native-born mobility responses to immigrant inflows, however, is mixed. William H. Frey (1995, 1996) reports a strong correlation between immigrant inflows and native outflows, and he argues that this behavior is leading to a "demographic balkanization" of U.S. cities. Richard A. Wright et al. (1997) reexamine Frey's specifications and conclude that native outflows from large metropolitan areas are unrelated to immigrant inflows. Likewise, Kristin F. Butcher and Card (1991) find no evidence that native population flows are related to immigration inflows. Randall K. Filer (1992) and Borjas et al. (1997), however, find evidence consistent with a "skating rink" model of native location decisions: each new immigrant knocks a native off the ice.

In this paper, we analyze the extent to which immigrant inflows over the 1980's have changed the distribution of skills across cities. Specifically, we focus on the causal relationship between immigrant inflows and native-born location decisions that is at the heart of both the "skating rink" and "demographic balkanization" hypotheses. Our analysis exploits several key aspects of recent immigrant inflows. First, there is considerable diversity in the skill levels of new immigrants (Butcher and DiNardo, 1998), with Mexican immigrants in particular being very likely to work in low-skilled occupations. Second, there is also much variation across cities in immigrant inflow rates. As a consequence of these facts, there are remarkable differences across cities in the relative inflows rate of less-skilled immigrant labor. By correlating the relative population movements of native workers in different skill groups with these relative inflow rates, we are able to estimate the net impact of immigration inflows on the relative skill distributions of different cities. To address the concern that unskilled immigrants may be drawn to cities that are experiencing rising relative demand for unskilled labor, we exploit a third important aspect of U.S. immigration: the tendency of newly arriving immigrants to settle in places where previous immigrants from the same country already live.

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[1] Two recent surveys are those by George Borjas (1994) and Rachel H. Friedberg and Jennifer Hunt (1995).

Specifically, we use the fraction of Mexican immigrants in a city in 1970 as an instrument for the relative inflow rate of low-skilled immigration to the city over the 1980–1990 period, while controlling for historical differences in native mobility patterns. Use of this "supply side" instrument gives no indication that unobserved skill-group-specific demand shocks can explain the relative flows of native workers in response to immigrant inflows.

I. Data Issues

Our analysis is based on microdata from the 1970, 1980, and 1990 decennial Censuses. Use of these data immediately raises two important conceptual issues: (i) the definition of skill groups and (ii) the definition of "local" labor markets. The definition of skill groups is potentially important to our analysis since we wish to compare the relative migration responses of natives who are in most direct competition with newly arriving immigrants and ultimately evaluate the effect of immigration on the distribution of human capital. One natural way is to use information on occupation.[2] Specifically, we first construct three equally sized occupational groups for each Census year, based on average weekly wages in each occupation. Next, for each year and for each of four gender/nativity groups, we fit multinomial logit models for the probability of working in the three occupation groups. These models include flexible functions of the usual human-capital variables: education, race, labor-market experience, and (for the immigrant groups) country of origin and year of arrival in the United States. The models also include detailed geographic controls in order to capture any distortions in the occupation distribution caused by immigration or other factors. We use these models to assign to all adults (workers and nonworkers) a set of probabilities for working in each of the three occupations in a nationally representative labor market. These probabilities are then used to compute estimates of the relative population of natives and immigrants in each of the three skill groups in each city. (For example, the number of immigrants in the lowest skill group in a city is a weighted count of immigrants in the city, using as a weight the probability of working in the lowest occupation group.) Because of space limitations we do not display information on our assignment of individuals to skill groups, but there are few surprises. The lowest-skill group, for example, is disproportionately female in all years and has the lowest level of education. Also consistent with previous research, the occupational distribution for immigrant men in 1970 is quite similar to the native-born distribution, while by 1990, immigrant men are substantially overrepresented in the lowest occupation group.

The definitions of the local labor markets used in our analysis are similarly important. Previous work has used both state-level data (e.g., Borjas et al., 1997) or Metropolitan Statistical Area (MSA)-level data. As we document below, one limitation of a state-level approach is that there are important differences in native and immigrant population flows even within the same state. The smallest geographic unit that can be easily made consistent across Censuses is the MSA. As a practical matter, we therefore limit our attention to 119 larger MSA's that had relatively stable geographic boundaries between 1970 and 1990. These cities range in size (in terms of population aged 16–68) from 150,000 to 5.8 million in 1970, and from 128,000 to 5.9 million in 1990.[3]

A brief overview of the remarkable intercity differences in population growth rates and changes in the skill distribution over the period

[2] The literature has adopted several different skill classification systems: by demographic characteristics such as gender, age, and education; by location in the wage distribution; and others. Each of the alternatives can be easily criticized. For example, if foreign education is less valuable in the U.S. labor market, then immigrants with a specific level of education may compete most directly with natives in a lower education category. Moreover, the process of assimilation implies that immigrants with given characteristics compete at a lower rung of the job market when they first enter the country and then gradually move up the ladder as they accumulate language skills and country-specific human capital. Finally, distinctions between some demographic groups (e.g., between men and women with the same level of education) may artificially limit the degree of competition we measure between immigrants and natives. As a practical matter, our experience suggests that the problem is more apparent than real.

[3] However, even at the level of the MSA, changing geographic definitions do not make a simple match across the 1970, 1980, and 1990 Censuses straightforward for all MSA's. In cases where there have been significant changes in the composition of MSA's we have used the county group codes to make them as comparable as possible (see David A. Jaeger et al., 1999).

TABLE 1—COMPONENTS OF POPULATION GROWTH AND RELATIVE POPULATION GROWTH FOR SELECTED CITIES, 1980–1990

	Percentage growth		
City	Total	Immigrants	Natives
A. *Total Population Growth, 1980–1990*			
Los Angeles, CA	14.8	20.7	−5.9
New York, NY	−16.4	1.6	−18.0
Chicago, IL	−14.0	0.9	−14.9
Philadelphia, PA	−15.6	−0.3	−15.4
Washington, DC	16.8	8.3	8.5
Detroit, MI	−25.0	−1.9	−23.1
Houston, TX	11.9	8.1	3.8
Boston, MA	12.3	4.3	8.0
Anaheim, CA	28.2	21.4	6.8
Dallas, TX	−5.0	4.8	−9.8
Miami, FL	25.8	26.7	−1.0
Tampa, FL	28.2	4.0	24.2
San Diego, CA	26.5	11.8	14.7
San Jose, CA	17.9	16.8	1.1
Atlanta, GA	21.0	3.6	17.4
Pittsburgh, PA	−13.7	−0.8	−12.9
B. *Relative Growth of Lowest-Skill Group*			
Los Angeles, CA	15.8	13.5	2.3
New York, NY	4.3	2.9	1.4
Chicago, IL	0.3	1.6	−1.3
Philadelphia, PA	−1.9	0.0	−1.9
Washington, DC	1.7	3.9	−2.2
Detroit, MI	0.1	−0.1	0.2
Houston, TX	11.9	5.8	6.1
Boston, MA	−6.0	1.4	−7.4
Anaheim, CA	12.9	14.8	−1.8
Dallas, TX	4.2	3.3	0.9
Miami, FL	15.5	11.7	3.8
Tampa, FL	1.9	1.5	0.4
San Diego, CA	6.0	7.4	−1.5
San Jose, CA	9.9	8.2	1.7
Atlanta, GA	−0.6	1.1	−1.7
Pittsburgh, PA	−2.2	−0.2	−2.0

Note: The table is based on tabulations of 1980 and 1990 public-use Census files (see text).

from 1980 to 1990 is provided by Table 1. Panel A decomposes the adult population growth rate for selected MSA's in our sample into components attributable to natives and immigrants. Panel B does the same for the relative growth rate of the lowest-skill group (i.e., the growth rate of the population of the lowest skill group minus the growth rate for the total population). There is much heterogeneity in population growth across cities (even in the same state) and in the relative contributions of immigrants and natives to total population growth and the growth of the low-skilled population. In California, for example, Los Angeles, San Diego, and San Jose all experienced large increases in the size of their (disproportionately low-skilled) immigrant populations. San Diego had a rapidly rising native population, San Jose's native population was roughly constant, and Los Angeles saw the size of its native-born population fall 6 percent. In Florida, Miami and Tampa both experienced similar increases in total population, although the increase was virtually all immigrants in Miami and mainly natives in Tampa. Interestingly, this difference was associated with a sharp increase in the relative size of the low-skilled population in Miami, but a more stable relative skill distribution in Tampa.[4] Finally, New York, Chicago, and Philadelphia all had relatively small changes in their immigrant populations but experienced sizable declines in their native-born populations.

II. Empirical Framework

Our analysis proceeds by observing that both the area analyses and the "general equilibrium" approach of Borjas et al. (1997) begin with the presumption that the extent to which immigrant population inflows affect the relative wage and employment outcomes of the native-born population depends on the extent to which inflows change the proportion of the population in different skill groups (DiNardo, 1997). For instance, in a model in which each city produces a nationally traded output using a production function that depends on a constant-elasticity-of-substitution (CES) aggregate of different labor types, wages will be related to local-skill-group shares by an equation of the form

$$\log w_{jc} = -1/(\sigma + \varepsilon)\log(P_{jc}/P_c) + u_j + u_c + e_{jc}$$

[4] The fact that total population growth in Miami was similar to that in Tampa (and other Florida cities) has been used by some analysts (e.g., Borjas, 1994) to argue that the 1980 Mariel Boatlift had no net effect on Miami's population. As shown in Table 1, however, this misses the fact that the relative size of the unskilled population increased very rapidly in Miami relative to Tampa or most other cities.

where w_{jc} denotes the wage of skill-group j in city c, P_{jc} is the population of skill-group j in city c, P_c is the total population of the city, σ is the elasticity of substitution across skill groups, ε is the elasticity of labor supply (assumed to be common across skill groups), u_j represents a fixed effect for skill-group j, u_c is a city effect reflecting permanent differences in productivity across cities, and e_{jc} is an error component reflecting city-specific relative demand shocks and other factors.[5] If immigrant inflows are proportional to the existing distribution of skills (or if native outflows completely "undo" immigrant inflows), then a rise in the immigrant population will have no effect on the structure of wages. If immigrant inflows lead to a rise in the relative share of a particular skill group, however, then the relative wage of that group would be expected to fall.

Assuming that the wage structure in different cities depends on the relative skill distribution (and not on the total size of a city's population), we direct our attention to the effect of immigration inflows on the relative fraction of workers in the three skill groups described above. The use of skill shares has the appealing feature that the empirical results are not likely to be too sensitive to the definition of the appropriate labor market. For instance, aggregating two identical regions leaves the predictions for relative wages unchanged. Moreover, changes in the boundaries of an MSA (such as occurred in many cities over the 1970–1990 period) would not necessarily distort relative skill shares, although they would lead to spurious changes in overall population.

For our empirical analysis it is useful to decompose changes in $\log(P_{jc}/P_c)$ into a component determined by immigrant population changes and a component determined by native population changes. The total population of a city and the population in each skill group can be written as the sum of the populations of immigrants (M) and natives (N) (i.e., $P_c = M_c + N_c$). Using this fact, the change in the log of the fraction of the population in skill-group j in city c is approximately

$$(1)\qquad \Delta \log(P_{jc}/P_c) = (\Delta M_{jc}/P_{jc} - \Delta M_c/P_c) + (\Delta N_{jc}/P_{jc} - \Delta N_c/P_c).$$

The first term in (1) is relative growth rate of the population of skill-group j attributable to immigrants, which we call the "relative growth rate of immigrants in skill-group j," while the second term is the corresponding contribution of natives, which we call the "relative growth rate of natives in skill group j." With this decomposition in hand, we next posit a simple behavioral equation summarizing the reaction of natives to changes in the relative supply of immigrants in their own skill group:

$$(2)\qquad (\Delta N_{jc}/P_{jc} - \Delta N_c/P_c) = a + b(\Delta M_{jc}/P_{jc} - \Delta M_c/P_c) + v_{jc}$$

where v_{jc} is a skill-group- and city-specific error term. This equation implies that the overall change in the log population share of a specific skill group is related to the relative immigrant inflow rate for that skill group by

$$\Delta \log(P_{jc}/P_c) = a + (1 + b)(\Delta M_{jc}/P_{jc} - \Delta M_c/P_c) + v_{jc}.$$

If native-born location decisions fully offset immigrant inflows, the coefficient b is equal to -1, and we have the skating-rink model: local skill shares are unaffected by immigrant inflows. Moreover, a value of b close to -1 suggests a "demographic balkanization": inflows of low-skilled immigrants will cause low-skilled natives to move out, causing cities that experience such inflows to become increasingly high-immigrant. At the opposite extreme, a value of $b = 0$ implies that the mobility decisions of natives in a particular skill group are not differentially affected by immigrant inflows in the same skill group. A value of $b = 0$ does not imply that native location decisions are insensitive to immigrant inflows—only that the

[5] We are assuming that each worker in each skill group supplies a fixed number of units of labor, if he or she decides to work, and that the fraction who work is a constant-elasticity function of the wage, with elasticity ε (see Card [2000] for details).

population changes of natives in different skill groups are not affected by the relative inflow rate of immigrants in the same skill group.

We use data on population changes from 1980 to 1990 for 119 large MSA's to derive two estimates of the coefficient b in equation (2). In view of the strong focus of the recent literature on low-skilled migrants, we first use data for our lowest-skill group (providing us with one observation per city). In a second set of specifications, we pool data for all three skill groups and include unrestricted city fixed effects. These effects capture any unobserved city-level factors (such as local demand shocks) that might be correlated with immigrant inflows and native migration flows.

As a first specification test, we augment the simple model of equation (2) with a set of plausibly exogenous covariates to allow for the possibility (raised by Borjas et al. [1997]) that a simple first-differenced specification may not adequately capture the dynamics of population change. (Note that our use of *relative* growth rates may partially obviate this concern.) Specifically, we include the relative growth of the native population over the period 1970–1980 (i.e., the lagged dependent variable) and the fraction of immigrants in the relevant skill group in 1980. We also include measures of city population growth over the periods 1970–1980 and 1980–1990 in the models for the lowest-skill group that exclude city fixed effects.

Columns (i) and (ii) of Table 2 display the results of estimating equation (2) by weighted ordinary least squares (OLS). The estimates show no evidence that native out-migration rises in response to immigrant inflows. In our basic specification in column (i) of panel A the point estimate of b for the lowest-skill group is 0.12 with a standard error of 0.07. This suggests, if anything, that a relative inflow of unskilled immigrants leads to a (slight) increase in the relative growth of the unskilled native population. In panel B, where we display results that include data from all three skill groups, the point estimate for b is virtually unaffected. The addition of controls for preexisting trends in relative population growth and for the fraction of immigrants in the city in 1980 in column (ii) yields estimates of b that are somewhat more imprecise but generally similar to the results in column (i).

TABLE 2—ESTIMATED MODELS FOR THE RELATIVE GROWTH RATE OF THE NATIVE POPULATION IN SPECIFIC SKILL GROUPS, 1980–1990

	OLS		IV	
Variable	(i)	(ii)	(iii)	(iv)
A. *Lowest-Skill Group Only*				
Relative growth of immigrant population	0.12 (0.07)	0.24 (0.13)	0.41 (0.16)	0.61 (0.34)
Relative growth of native population, 1970–1980	—	−0.24 (0.10)	−0.34 (0.12)	−0.32 (0.12)
City population growth, 1980–1990	—	−0.02 (0.02)	−0.03 (0.02)	−0.04 (0.03)
City population growth, 1970–1980	—	−0.02 (0.02)	−0.03 (0.02)	−0.04 (0.03)
Fraction of immigrants in skill group in 1980	—	0.00 (0.04)	—	−0.10 (0.10)
R^2:	0.03	0.10	0.09	0.09
t for instrument in first stage:	—	—	6.95	4.77
B. *Pooled Models for Three Skill Groups*				
Relative growth of immigrant population	0.15 (0.06)	0.11 (0.08)	0.28 (0.09)	0.24 (0.22)
Relative growth of native population, 1970–1980	—	−0.17 (0.05)	−0.17 (0.05)	−0.17 (0.05)
Fraction of immigrants in skill group in 1980	—	0.24 (0.15)	—	0.08 (0.28)
R^2:	0.81	0.82	0.81	0.81
t for instrument in first stage:	—	—	13.51	6.74

Notes: Standard errors are reported in parentheses. Models in panel A are fit to observations for 119 metropolitan statistical areas (MSA's): the dependent variable is the relative growth in the native population in skill-group 1 between 1980 and 1990. Models in panel B are fit to pooled data for three skill groups in 119 MSA's, and include unrestricted city effects: the dependent variable is the skill-group-specific relative growth in the native population. Instrumental variables (IV) models [columns (iii) and (iv)] treat the relative growth of the immigrant population as endogenous. The instrument in panel A is the fraction of Mexican immigrants in the city in 1970; the instrument in panel B is the skill-group-specific fraction of Mexican immigrants in 1970.

Some additional insight into the OLS results is provided by Figure 1, which presents a simple bivariate plot of the relative growth

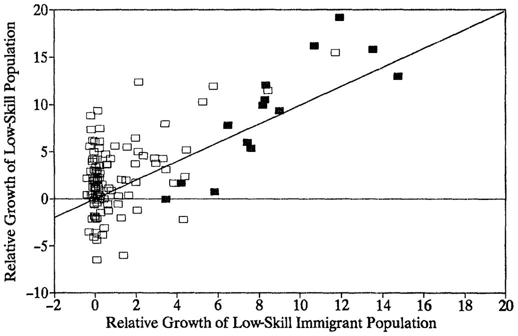

FIGURE 1. RELATIVE GROWTH OF LOW-SKILL IMMIGRANT POPULATION AND THE TOTAL LOW-SKILL POPULATION

Notes: Filled symbols denote California MSA's.

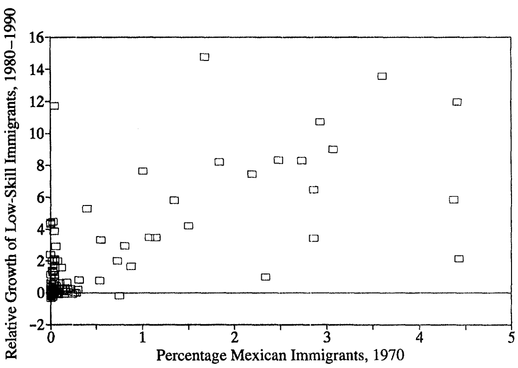

FIGURE 2. PERCENTAGE OF MEXICAN IMMIGRANTS IN 1970 AND THE RELATIVE GROWTH OF THE LOW-SKILL IMMIGRANT POPULATION, 1980–1990

of the low-skill population against the relative growth of the low-skilled immigrant population. For reference, the figure also includes the 45° line (corresponding to $b = 0$ in our regression specifications) and a horizontal line at 0 ($b = -1$, the skating-rink model). Given the large immigrant inflows to many California cities, it is interesting to note that the individual MSA's of the state (which are highlighted as filled symbols in the graph) are scattered fairly evenly around the 45° line. Fresno, Los Angeles, and Riverside experienced slightly more than proportional increases in the relative growth of the low-skill population in response to the increase in the low-skill immigrant population, while Anaheim, San Diego, and Oakland experienced slightly less than proportional increases in the relative growth of the low-skill population. Also interesting is the fact that no city experienced a large relative outflow of low-skill immigrants over the 1980–1990 period.

A possible objection to inferences based on the scatter in Figure 1 (or the OLS estimates in Table 2) is that immigrant and native population growth patterns may be driven by city- and skill-group-specific relative demand shocks that attract natives and immigrants in the same skill group to certain cities. In the presence of such shocks, OLS estimates of b will tend to be upward-biased. Suppose, however, that some part of immigrant inflows are determined by supply-side considerations, specifically, the tendency of recent immigrants to locate in cities with a large number of previous migrants from their country (Anne P. Bartel, 1989). In that case, we can use the existing stock of immigrants from a specific country as an instrumental variable for changes in the immigrant skill share. One effect of the changes in immigration laws that occurred in the 1960's was a rapid increase in the number of immigrants from Mexico. The existence of enclave effects suggests that the fraction of Mexican immigrants in a city in 1970 (largely before the big supply shock) can serve as a potential instrumental variable for later immigrant inflows, and particularly for the relative inflow of the lowest-skill group. In Figure 2, we present a simple plot of the relative growth rate of low-skill immigrants over the 1980–1990 period against the percentage of Mexican immigrants in each city in 1970. As predicted by the enclave hypothesis, there is a strong positive association between the two.

Columns (iii) and (iv) of Table 2 present instrumental-variables (IV) estimation results for equation (2) using the fraction of Mexican immigrants in the appropriate skill group in the city in 1970 as an instrumental variable for the relative growth of the immigrant population in the skill group. Perhaps surprisingly, in every case the IV point estimate of the coefficient b is larger (i.e., more positive) that the corresponding OLS estimate. One possible explanation for this pattern is that the OLS estimates are downward-biased by measurement errors in the immigrant inflow rates. This is quite plausible, given slippage in our definition of skill groups, and possible errors arising from changes in the geographic boundaries of cities. As with the OLS models, the addition of controls for previous native population flows and the fraction of immigrants in 1980 has little effect on the IV estimates of b.

A growing literature has stressed the potential problems with IV methods when the instrumental variable is only weakly related to the endogenous variable (see e.g., John Bound et al., 1995). To address this concern, the last row of panels A and B in Table 2 report the t statistic associated with the coefficient on our instrumental variable (the fraction of Mexican immigrants in the city in 1970) in the first-stage equation. Confirming the impression from Figure 2, the coefficient on the instrumental variable is highly significant, with t ratios ranging from 4.77 to 13.51. Thus, weak instruments are not a particular concern.

III. Caveats and Conclusions

Using data from the 1970, 1980, and 1990 Censuses, we investigated the extent to which skill-group-specific changes in the immigrant population across various MSA's has led to a flight of similarly skilled native-born individuals from these MSA's. Contrary to the demographic-balkanization hypothesis, our point estimates suggest that, if anything, increases in immigrant population in specific skill groups lead to small *increases* in the population of native-born individuals of the same skill group. This pattern also suggests that systematic out-migration by native-born individuals is unlikely to provide an explanation of the small measured effects of immigration on the labor-market outcomes of the native-born population found in most "area analyses." Indeed, we find that immigration has had quite significant impacts on the skill distribution of various MSA's. Based on this evidence, we conclude that the local labor-market impacts of unskilled immigration are mitigated by other avenues of adjustment, such as endogenous shifts in industry structure, rather than by rapid adjustments in the native population.

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The American Economic Review, Vol. 90, No. 2, Papers and Proceedings of the One Hundred Twelfth Annual Meeting of the American Economic Association. (May, 2000), pp. 360-367.

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[Footnotes]

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Searching for the Effect of Immigration on the Labor Market

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