International Immigration and Domestic Out-Migrants: Are Domestic Migrants Moving to New Jobs or Away from Immigrants?*

February 17, 2010

by

Kamar Ali
University of Lethbridge
kamar.ali@uleth.ca

Mark D. Partridge
The Ohio State University
Partridge.27@osu.edu

Dan S. Rickman
Oklahoma State University
dan.rickman@okstate.edu

Abstract: Local area domestic migrant responses to geographically-concentrated immigration flows play central roles in determining the aggregate local economic impacts of immigration and the geography of the ethnic composition of the population. Possible motivations for domestic migrant responses include increased labor market competition associated with new immigrants and ethnic or cultural avoidance. This paper uses U.S. annual state-to-state migration flows from the Internal Revenue Service to assess whether geographically-concentrated immigration induces domestic migrant responses. And, if so, what motivates the domestic response. The paper finds some evidence of a domestic migrant response, particularly to greater cumulative shares of the foreign born. This is interpreted as providing some support of the ethnic or cultural avoidance hypothesis.

*This paper is for presentation at the Western Regional Science Association Meetings in the invited sessions in honor of Gordon Mulligan organized by John Carruthers.

1. Introduction and Literature Review

The domestic migrant response to geographically concentrated flows of immigrants has become a central issue in the immigration debate. Geographic areas serving as gateways for immigrants in the U.S. in recent decades have often experienced significant net domestic out-migration. The issue is of importance because the out-migration response affects the geographic spread of labor market effects of immigration (Borjas, Freeman, and Katz, 1996) and the potential for geographic ethnic segregation and (Frey, 1995a), as well as related sorting by class.

From 1985 to 1990, among the high immigration states of California, New York, Texas, New Jersey, Illinois and Massachusetts, all but California experienced significant domestic out-migration, with California subsequently experiencing net domestic out-migration after 1990 (Frey, 1995a). The top six gateway cities for immigrants from 1990 to 1996 (Los Angeles, New York, San Francisco, Chicago, Miami, and Washington, D.C.) collectively received more than 2.8 million immigrants while also losing 3.4 million net domestic migrants (Frey, 1999). At the U.S. county level, Partridge, Rickman and Ali (2008b; 2009) report significant domestic out-migration to be associated with higher rates of immigration for both nonmetropolitan and metropolitan areas for the period of 2000-2005. From 2000 to 2009 four of the six states with the most number of immigrants (California, Texas, Florida, New York, Illinois and New Jersey) also had the most domestic out-migrants. Yet, when considered as population shares rather than absolute numbers, Nevada and Arizona become among the top immigration states, replacing New York and Illinois, and hence only two of the six top immigration states have the highest rates of domestic out-migration.[1] Explanations in the literature for the potential connection between net domestic migration and immigration have been varied.

A primary explanation focuses on the potential displacement of domestic residents by immigrants in the local labor market. For example, according to what we term the Borjas (2003; 2005) "bathtub" model, immigrants represent an increase in the local labor supply, which

[1] The correlation across states (including the District of Columbia) between the numbers of immigrants and domestic migrants is -0.32 while that between the flows when taken as shares of state population is 0.15. All figures are based on calculations by the authors using U.S. Census Bureau data accessed at http://www.census.gov/popest/states/NST-comp-chg.html on December 23, 2009.

reduces the local wage rate. To the extent immigrants and domestic workers are perfect substitutes in production the reduction in the wage rate induces domestic out-migration until the wage rate climbs back to the spatial equilibrium level. The net out-migration can occur either through out-migration of existing residents (Card, 1990, 2000; Card and DiNardo, 2000), or by attracting less domestic residents from elsewhere (Filer, 1992; Keeton and Newton, 2005). Labor market effects then are dispersed across the nation, much as water added to a bathtub levels out.

Frey (1995b, 1995c) finds rates of outmigration among local natives in high immigration areas to be greatest for those with a high school education or less. This presumably occurs because they primarily compete with low-skilled immigrants for jobs. Walker, Ellis and Barff (1992) similarly found a net loss of one blue collar worker for every seven immigrants into a metropolitan area. Likewise, at a superficial level, one would expect immigrants and domestic workers to be most substitutable in rural regions with a relatively low skilled employment distribution—e.g., food processing, agriculture, etc. Thus, it is not surprising that Partridge et al. (2008b) found strong evidence that new immigrants displaced domestic residents in their examination of nonmetropolitan U.S. counties.

Yet, other forces may produce the opposite relationship or no relationship whatsoever. Complementarity in production between low-skilled immigrants and both high-skilled domestic residents and capital can produce a positive relationship between high-skilled domestic migration and immigration (Walker, Ellis and Barff, 1992). If immigrants locate in areas where there are shortages for their skill type, rather than domestic out-migration, population of the area grows (Saiz, 2003). Immigrants may fill jobs that domestic residents do not want and even create jobs at a scale that exceeds what would happen in the absence of immigration (Linton, 2002). Consistent with this varying pattern of immigration effects, Partridge et al. (2008a, 2008b) find heterogeneous effect in which immigration appears to have its strongest impacts on county employment in the Western United States.

Wright et al (1997) indeed find a statistically positive relationship between the number of immigrants and the number of natives with high levels of education. The essence of their argument lies in the fact that the largest U.S. metropolitan areas have been serving as the gateways for immigrants. Concurrently, globalization may have led to labor-market restructuring in large metropolitan areas, in which the demand for high-skilled labor increases, while "deskilling and downgrading in both manufacturing and service sectors" (p. 239) reduces low-skilled wages, inducing their out-migration, with immigrants filling newly created low-wage jobs. Frey (1996) contends, however, that the decline in urban manufacturing jobs was greatest in the 1970s and 1980s, not the 1990s when the negative relationship between immigration and domestic out-migration was strongest.

The use of terms such as "balkanization" (Frey, 1996) and "white flight" (Frey and Liaw, 1998) to describe demographic trends in immigration and domestic migration suggests that cultural or ethnic differences underlie domestic out-migration from gateway cities (Ellis and Wright, 1998). Admittedly, labor market competition arising from concentrated immigration affects age and education groups differentially, also often falling along ethnic lines. However, in what Ley (2007, p. 232) classifies as "cultural avoidance" in his taxonomy of explanations for the nexus between immigration and domestic migration, white domestic residents may be reluctant to have neighbors of differing cultures and ethnicities. This reluctance includes the possibility that immigrants are associated with increased social costs, leading to domestic out-migration aside from labor market considerations. For example, Alesina et al. (1999) report lower levels of local public services in urban areas with more diverse populations.

More recent evidence on the composition of domestic out-migrants casts doubts on the cultural avoidance explanation. Frey (2003) reports that whites were underrepresented and nonwhites were overrepresented among domestic out-migrants from New York City and Los Angeles from 1995 to 2000. Suro and Singer (2002) find greater out-migration and less in-migration of the lesser-educated across all races and ethnicities from states with high levels of foreign-born education. Leach and Bean (2008) similarly find Mexican migrants, driven by demand factors, to be dispersing into non-traditional areas. Between relocation of immigrants and natural population increases, Johnson and Lichter (2008) report about one-half of the Hispanic population as living outside of traditional gateway states. Similarly, Kritz and Gurak (2001) found that in only five states was a net gain in working-age foreign born men accompanied by a net loss of native-born non-Hispanic men from 1985-1990, with only one state (Hawaii) among the five high immigrant states. One implication of these studies is the need to focus on both domestic migrants and the foreign born to examine the "white flight" or cultural-avoidance hypothesis.

Along with potential complementarity between immigrants and natives in production, Ottaviano and Peri (2006) suggest that the variety of urban consumption amenities such as ethnic restaurants accompanying a high rate of immigration is attractive to native households. As such, the value of total production is enhanced. They provide evidence in form of the increase in U.S. born citizens' wages and housing rents between 1970 and 1990 in metropolitan areas where the foreign-born share increased. Similarly, wage evidence is provided by Greenwood, Hunt, and Kohli (1996), who find the most recent immigrants only having significant adverse wage effects on other recent immigrants but not on natives or non-recent immigrants, suggesting that the most recent immigrants are less substitutable with natives or non-recent immigrants.

Ottaviano and Peri (2006, 2008) note that considering the labor market in the aggregate versus focusing on narrow groups (e.g., low-educated whites) is needed to capture the full range of general equilibrium outcomes that may occur. For instance, a new Thai immigrant restaurant may displace an existing American style diner, producing no net change in restaurant employment, though abundant low-skilled immigrants and cultural diversity may attract highly educated domestic workers. Another key factor is how the capital stock adjusts to influxes of immigrants influence native-born wages (Ottaviano and Peri, 2008).[2]

Therefore, in this study we examine the link between domestic migration and immigration for U.S. states. Immigrants are defined as the net of those directly arriving from a foreign country into a state versus those moving out of a state to a foreign country. Domestic migration includes individuals already residing in the United States who change their state of residence, which include both U.S. natives and the foreign-born who have resided in the U.S.

We employ a labor market model along the lines of Borjas (2003; 2005) and Partridge, Rickman and Ali (2008b; 2009). Domestic migration depends on measures of labor demand, natural amenities, immigration, and the share of the population that is foreign born. Controlling for labor demand and natural amenities allows for isolation of potential labor supply effects of immigration. The share of the population which is foreign born is included to capture potential cultural avoidance threshold effects. Furthermore, instrumental variables (IV) estimation is used to account for potential statistical endogeneity. For example, IV estimation accounts for whether immigrants may be attracted to faster growing states, as well as the possibility that higher domestic migration rates may "reverse cause" labor demand.

In contrast to Partridge, Rickman and Ali's (2008b; 2009) examination of aggregate net-migration flows, we also examine place-to-place domestic migration flows using U.S. Internal Revenue Service (IRS) data. This allows for more direct analysis of the type of states selected by domestic migrants. Further it allows for consideration of the role of distance in influencing domestic migration between states. A disadvantage of using place-to-place flows is the

[2]An item of debate is how immigrant flows affect native-born wages on the *national* level. For example, Borjas (2003) find that a 10% increase in immigrants reduces low-skilled native wages by 3 to 4%, which is a finding confirmed by Borjas et al. (2008). Yet, Ottaviano and Peri (2008) show that relatively modest changes in assumptions can lead to the possibility that wages for native-born workers may even be *positively* related to immigration in the aggregate. In particular, Ottaviano and Peri assume that the capital stock positively adjusts to immigrant flows and they find that the elasticity of substitution between immigrants and native workers within education cohorts equals 20 (versus infinity in Borjas et al's model). See Longhi et al. (2005) for further discussion of how immigrants affect native-born wages.

extensive number of zeros or near absent flows between pairs of counties, which leads to our use of states as the units of analysis.

There are 1,128 state-to-state migration flows for the lower 48 states. This provides considerably more information than the standard approach, which would be analogous to only estimating the 48 state net-migration rates on immigration rates and other control variables (e.g., Borjas, 2005). Moreover, the state-to-state data allow us to consider whether the domestic out-migrants are moving to states with relatively greater (or lower) shares of the foreign born than the origin state, which is an issue that has not been considered in past research. For example, we can answer whether domestic out-migrants are primarily driven by labor market effects or by possible aversion to states with greater shares of the foreign born, not just new immigrants.

II. Empirical Implementation

The theoretical model follows from Borjas' (2003, 2005) bathtub model as implemented by Partridge, Rickman, and Ali (2008b, 2009). It can be briefly described as a basic labor demand and labor supply model that determines wages with domestic and immigrant labor being perfect substitutes. In equilibrium, real wages are equalized across regions. In disequilibrium, workers migrate to reestablish equilibrium wage levels across all labor markets. For example, one more immigrant worker migrating to a state implies that one domestic worker will out-migrate to another state. This follows because new immigrants increase local labor supply and reduce wages. Domestic workers will then out-migrate until wages are equalized across all local labor markets. The effects of immigration are dispersed across the country, leading to a "bathtub" effect.

We use the IRS state-to-state migration dataset comprised of gross in-flows and out-flows based on personal income tax returns to derive our domestic migration measures. Tax return data typically form the core of U.S. Census Bureau estimates of domestic migration. A state-to-state migration occurs when the address of the filer has changed states between tax years. The gross in- and out-flow numbers are then based on the number of exemptions on individual tax returns.

Not every internal U.S. migrant files tax returns, but the underlying assumption is these unreported domestic moves are in proportion to the IRS migration estimates. Likewise, immigration figures are also derived from the tax return data, where new immigrants reflect the number of exemptions on tax returns in which the filer lived abroad in the past year.

We alternately specify four different migration outcome measures as our dependent variable (including District of Columbia but excluding Alaska and Hawaii). First, we start with the aggregate net-migration rate for each state *i* that is typical in this literature:

(1) $[NETMIG_i/POP_i] \times 1000000$,

which is defined as the average annual net migration into a given state over the 1993-2007 time period divided by the beginning 1993 population. The advantage of the overall net migration rate is that it replicates past research (e.g., Borjas, 2005; Partridge and Rickman, 2008b, 2009). Likewise, using aggregate net-migration is consistent with Borjas' model of aggregate labor-market demand and supply—it is not an individual state-to-state model of migration. However, there are three problems with using aggregate net migration. First, there are only 49 observations using state data. Second, when using aggregate net flows, we are unable to identify the types of states that in-migrants are choosing. Third, it ignores the role of distance because for each state the flows between it and all other states are weighted equally. For example, a large out-flow in one state may produce greater migration flows to nearby states than their characteristics would suggest because of close proximity (Douglas, 1997).

Thus, we next consider state-to-state migration flows in an attempt to uncover the types of states domestic migrants favor when they exit a given state. Our first measure considers every state-to-state net-migration pair (e.g., Alabama has net-migration flows with the "48" other states). Denoting the gross in-migrants moving to state *i* from state *j* as M_{ij}, we employ the following two state-to-state net-migration measures:

(2) $[(M_{ij}-M_{ji})/(Pop_i+Pop_j)*0.5)]*1000000$

(3) $[(M_{ij}-M_{ji})/(Pop_i*Pop_j)]*1000000*1000000$,

where the annual migration figures are averaged over the 1993-2007 time period, while the population numbers are measured at the beginning of the period. Our preference is the measure in equation 2 because it is closest to the net-migration definition in equation 1—in which the respective two state populations are averaged in the denominator.[3]

The advantage of net migration figures is that it captures the relative growth of a particular place due to differential economic or quality-of-life reasons—i.e., households voting with their feet. Conversely, gross migration flow data are usually considerably more noisy because many migrants move for "random" reasons that are not easily accounted for by regression controls—e.g., family and other personal reasons. Thus, state-to-state net-flows balance out those types of "random" migration flows to reflect perceived utility differentials.

We next consider in-migration rates into destination state *i* from origin state *j* as the dependent variable.

(4) M_{ij}/POP_j

The tradeoff with using this measure is that our theoretical immigration model is not based on gross migration flows. Yet, the resulting empirical results help answer our questions about which particular destination-state characteristics are associated with in-migration. Another practical advantage is that we can use state fixed effects to account for other unmeasured factors such as industrial restructuring, age of infrastructure, quality of public services, etc.

All of the explanatory variable groups are measured as the destination state characteristics minus the origin state characteristics. For example, the job growth explanatory variable is measured as employment growth in the destination state minus that in the origin state. Alternately using the four migration outcomes ($OUTCOMES_{ij}$) as the dependent variable, the base regression model can be summarized as:

(5) $$OUTCOMES_{ij} = \beta_0 + \beta_1(IMG_i - IMG_j) + \beta_2(IMGSH_i - IMGSH_j) + \beta_3(EMP_i - EMP_j) + \beta_4(WAGE_i - WAGE_j) + \beta_5(GEOG_i - GEOG_j) + \sigma_s + e_{ij.}$$

where IMG is the average annual number of international immigrants that moved to the state over the period of interest divided by the initial 1993 state population. IMGSH measures the initial (1990) share of the state's population that is foreign born. EMP is state employment growth over the period, whereas WAGE is the initial 1993 wage level. The geography measures

[3] The measure in Equation (3) is used by Douglas (1997) to measure state-to-state migration.

include the state average of the U.S. Department of Agriculture's amenity index score—which runs from 1 (lowest) to 7 (highest). Another geography measure is an indicator variable for whether the state borders the Atlantic Ocean, the Pacific Ocean, or the Gulf Coast. Finally, when the in-migration rate is the dependent variable, the models include the log of the 1993 origin-state population, distance between the origin and destination states (measured from population-weighted centroid), and state fixed effects (σ_s).[4] The residuals are denoted as e_{ij}.

The expected effects of the variables are well known, so our discussion will be brief. Regarding the contemporaneous immigration flow measure, a 'Borjas' bathtub (2003, 2005) model suggests that all else equal, states with greater contemporaneous immigration rates will experience greater rates of domestic out-migration to states with lower immigration rates. Borjas' base model does not directly consider how the *initial* stock of immigrants affects domestic migration because presumably past flows of immigrants would have already affected wages levels and *past* domestic migration flows. Yet, if a given share of domestic households has a preference to live in a place with a low share of immigrants—perhaps due to 'noneconomic' concerns—then the initial population share of immigrants in a given state would be positively related to domestic out-migration and negatively related domestic in-migration. The initial state immigration shares are based on the 1990 or 2000 Census data.

Relative employment growth should attract in-migrants and deter out-migrants. Initial wage levels have a more ambiguous impact on net-domestic migration. From the firm perspective, it may deter firm start-ups and expansion, which would reduce demand for workers and dampen net-migration flows. Yet, from the household perspective, higher initial wage levels would attract greater net-migration flows. Controlling for initial wage levels accounts for the possibility that the initial immigrant share affects initial wage levels through composition effects (presumably lowering it on average), and thus the initial immigrant share variable will more cleanly control for the noneconomic effects of immigration. The state wage and employment

[4]Distance is not included in state-to-state net migration models because the distance effects that reduce migration gross flows from (say) Alabama to Arizona would likewise depress gross migration flows from Arizona to Alabama—producing no net impact.

data are taken from the Bureau of Economic Analysis website (www.bea.gov).

We expect that net-migration flows are positively related to the amenity index and to whether the state borders an ocean. Likewise, we expect in-migrant flows to be positively related origin state's population, while distance between origin and destination states would depress gross in-migration flows. The in-migration models will also include the destination state fixed effects (σ_s) because they account for other characteristics that in-migrants consider when choosing a state—e.g., the quality of housing, government services, or unmeasured industrial restructuring.

Endogeneity and Instrumental Variables. A long-running concern in this literature is that immigration may be endogenous because positive economic shocks may jointly increase immigration and net-migration. Following the literature (Card, 1990; Card, 2000; Card and DiNardo, 2000), we use deep lags of past immigrant stocks as instruments for current immigrant flows (which assumes that long-established immigrant networks attract new immigrant flows and signal a more welcoming atmosphere). Using Census data from the Geolytics company, our identifying instrumental variables for immigration are the 1970 share of the population that is either foreign born, or have one foreign-born parent and the 1980 population share that is foreign born, which follows Partridge et al. (2008b, 2009). To account for the key role of Mexican immigrants, another instrument is an indicator for states bordering Mexico.

Employment growth also could be endogenous to the same demand shocks that affect immigration. As our employment growth instrument, we use the state industry mix employment growth rate, which has been widely used as an exogenous instrument (Bartik, 1991; Blanchard and Katz, 1992). It is defined as the initial year's state employment shares in each (one-digit) industry multiplied by the national growth rate in each industry and then summed across all industries, forming the hypothetical growth employment growth rate if the state's industries grew at the national average over the sample period. Thus, changes in *national industry* demand are the exogenous shifters.

Demand shocks also could affect the initial-year wage level. Analogous to the industry mix variable, our identifying instrument for wage levels is a "wagemix" variable defined as the initial-year industry employment shares in each of state's industries multiplied by the national wage level in each industry, summing this across all industries. This value forms the hypothetical state wage rate if each of its industries paid the corresponding national average wage. National wage differences across industries then are the exogenous shifters.

III. Results

Table 1 reports the unweighted means and standard deviations for the variables across the various samples we employ. The first set of empirical results is reported in Table 2. Columns 1 and 2 report the results using the standard net-migration model employed by Card (2000) and Borjas (2005) with the aim of replicating the county-level results found by Partridge et al. (2008b; 2009).[5] Column 1 contains the OLS results while Column 2 shows 2SLS results treating 1993 wage level, 1993-2007 employment growth, and 1993-2007 immigration rate as endogenous. Both the OLS and IV results show the same pattern at the state level as prior studies found at the county level—i.e., higher immigration rates are associated with lower net migration rates.

Column 3 reports the results of a 2SLS model that substitutes 1993-2007 population growth for the (domestic) net-migration dependent variable. The annual average net-immigration coefficient is statistically insignificant, which again suggests that immigration flows are offset by out-migration of native domestic residents. Thus, the conclusion is that the aggregate state-level findings are consistent with previous county-level findings even though these results consider a different time period and are derived from a higher-level of geographic aggregation that obscure local migration within a given state.

The primary aim of this study is to assess whether migrants are primarily moving to better economic opportunities or whether they are influenced by "noneconomic motivations" related to high levels of immigrants. Thus, we assess whether controlling for contemporaneous immigrant flows, the initial stock of immigrants are also negatively associated to domestic net-

[5]Note that the definition of the net-migration variables slightly differs, though it does not affect the conclusions.

migration, because the initial stock is associated with these non-economic motivations.

Column 4 now adds the 1990 foreign-born share to the net-migration model, which is measured three years before the starting period of the immigrant flow variable. As can be seen, higher contemporaneous immigrant flows are associated with less domestic net-migration, in which the coefficient is a little smaller in magnitude than when the 1990 immigrant share is *not* included. Moreover, the 1990 immigrant share variable is also negative and statistically significant illustrating that, on balance, domestic migration is negatively related to the initial stock of immigrants.

The negative relationship between 1993-2007 domestic net-migration and the initial 1990 immigrant share is consistent with the hypothesis that domestic migrants avoid places with more immigrants in general, not only because they were crowded out by contemporaneous migration flows in which immigrants were substitutes for domestic labor supply.[6] Likewise, because initial wages are accounted for, the initial immigrant stock influence is presumably not working through wage effects. Thus, these results are consistent with the hypothesis that domestic migrants avoid places with concentrations of immigrants due to factors not directly related to labor market conditions.

Columns 1 and 2 of Table 3 now report the IV results of the state-to-state net migration models to directly consider whether on a state-by-state basis, whether domestic migrants tend to locate in particular states with different initial immigrant stocks. That is, while the aggregate state-level results suggest that domestic migrants are leaving states with higher immigrants flows and initial stocks, they do not directly tell us whether these domestic migrants are avoiding states with higher immigrant flows and (especially) stocks.

These models use the state-to-state dependent variables defined in equations 2 and 3. As noted above, we prefer the measure in column 1 because it is most directly comparable to the net migration and population growth models employed above. Also, the R^2 statistic is much higher

[6]The correlation between the 1990 foreign born share and the 1993-2007 immigration rate is only 0.17—which is not particularly high, suggesting that multicollinearity is not behind the results. Also note that with including the 1990 foreign born share, the immigrant flow variable remains well identified with the first-stage F-statistic on the identifying instruments equaling nearly 11.

for the model reported in column 1, which also suggests that using this dependent variable fits the data better. Before turning to the regression results, note that the joint Cragg-Donald F-statistic for the strength of the instruments is over 14, suggesting the instruments are strong.

The specific regression results suggest that state-to-state net-migration rates are not statistically related to most of the variables, with most variables being insignificant. However, in both models, the 1990 foreign born share is negative and statistically significant, suggesting that states with higher initial foreign-born shares receive fewer domestic net-migrants. Conversely, the difference in the respective state 1993-2007 immigration rates is statistically insignificant. Thus, while the aggregate state results in Table 2 suggest that contemporaneous immigration flows matter, when considering disaggregate state-to-state migration flows, migrants appear to be more influenced by the initial immigration shares. The results are consistent with the notion that at least some domestic migrants are avoiding states with high initial shares of immigrants.[7]

Column 3 of Table 3 reports the results when the dependent variable is in-migration to state *i* from state *j* using the dependent variable shown in equation 4.[8] This model more directly considers the types of states that domestic migrants are moving to. In this case, contemporaneous 1993-2007 immigration flows remain statistically insignificant in determining the in-migration rates on a state-by-state basis, which could be due to the state fixed effects accounting for migration flows in general. Likewise, the net immigration variable may be a little "noisy" on a state-by-state basis because it does not account for the type of immigrant flows that could affect domestic in-migration patterns.

These results are not a refutation of Borjas' model because his aggregate *net*-migration model was not developed to describe migration between individual state pairs and it is not aimed at describing *gross* in-migration. Nonetheless, the initial share of foreign born remains negative

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[7]Differential total employment growth is also statistically insignificant when considering state-to-state flows. A possible reason is that when considering state-by-state migration flows, overall differences in total job growth are too noisy of a measure. On a state-by-state basis, migration flows may be more directly related to the particular industries that are faring well in each individual state, while in the aggregate, overall job growth averages out these individual state industry-composition effects. This is akin to how the current-account balance between (say) Argentina and the U.S. is not necessarily very reflective of the overall U.S. current account balance.

[8]Note that the Cragg-Donald F-statistic is nearly 30, again suggesting that the instruments are quite strong.

and highly statistically significant (t=7.24). A one standard deviation increase in the percent foreign born is associated with a 0.77 standard deviation decrease in in-migration rates. Again, it appears that domestic residents are avoiding states that have high initial shares of foreign born, indicating other factors are at work rather than contemporaneous shifts in labor demand and supply. To be sure, note that this model accounts for state fixed effects to control for the types of states and the model also accounts for the initial wage level, meaning that the initial foreign-born share influence is *not* through its possible composition effect on initial wage levels.

Because domestic migrants who are not locating in "gateway" immigration states may be especially sensitive to the share of immigrants, Column 4 reports the results omitting in-migration rates into the eight high-immigrant "gateway" states of California, Arizona, New Mexico, Texas, Florida, New York, and New Jersey. These results show that the initial immigrant share coefficient is almost twice the magnitude in this regression, further suggesting that domestic migrants are avoiding states with initial immigrant shares, especially when choosing not to locate in a gateway state. Though we are not claiming that the results of these regressions are conclusive, they are consistent with the need for economists to consider the effects of noneconomic factors such as cultural or ethnic avoidance in their models.

IV. Conclusion

Using annual IRS state-to-state migration data, this paper estimated the domestic migrant response both to new immigrants and to the existing foreign born share of the population. While analysis of aggregate migration flows suggest net domestic out-migrant responses to immigration flows, the result did not hold in analysis of state-to-state flows. Nevertheless, examination of the state-to-state migration flows revealed a negative net-domestic migration effect from the foreign born share, suggesting domestic migrants may be motivated in part by ethnic or cultural avoidance. Further analysis of the state-to-state migration flows, revealed domestic in-migration as significantly negatively affected by the foreign born share but not by recent immigration flows, supporting the net migration results.

Overall, the results point to the need for economic models to include non-economic factors in examining the nexus between domestic migration and immigration. Likewise, more attention should be given to the cumulative effects of past immigration versus just the effects of current immigration flows. The dynamics of the relationship are further complicated by the increased rates of natural population growth in traditionally high-immigrant areas and the increasing share of previous immigrants among domestic migrants. More expansive models and micro-data appear to be needed to better account for these complexities.

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Table 1: Means and (Standard Deviations)[a]

	(1) Aggregate Net Migration rate/ %Population Change	(2) State-by-State Net Migration rate	(3) State-by-State In Migration rate
Dependent variables			
Avg. annual Net-migration rate at the state level (1993-2007)[b]	839.1 (5402.7)	na	na
Avg. annual Population Growth rate at the state level (1993-2007)[b]	0.95 (0.80)	na	na
Avg. state-by-state net migration rate EQN 2[c]	na	-0.18 (204.07)	na
Avg. state-by-state net migration rate EQN 3[d]	na	-1.12 (99.64)	na
Avg. state-by-state in-migration rate[e]	na	na	529.6 (1126.9)
Independent Variables			
Diff in immigration rate 1993-07	417.05 (330.36)	53.93 (464.28)	-4.31e-10 (467.3)
Diff in % foreign born 1990	4.72 (4.39)	1.02 (6.12)	0.0 (6.21)
Diff in employment growth 1993-07	0.26 (0.16)	-0.001 (0.22)	3.72e-11 (0.22)
Diff in Ocean border dummy	0.41 (0.5)	0.01 (0.70)	0.0 (0.70)
Diff in amenity rank	3.75 (1.02)	0.09 (1.44)	1.58e-12 (1.44)
Diff in ln(1993 wage)	10.08 (.15)	0.04 (.21)	2.73e-11 (.21)
ln(origin pop93)	na	na	15.00 (1.01)
Distance (km)	na	na	1658.73 (974.71)
Sample size	49	1176	2352

a. Unweighted Means and standard deviations are only reported when the variable is used in a specification with that sample. See the text for more details of the variable definitions.
b. Net migration rate is defined as the state's net-migration between 1993 and 2007 divided by 1993 population, multiplied by one million (Equation 1). The population growth rate is defined as the percentage change in population between 1993 and 2007. The sample statistics are for those used in for the models in Table 2.
c. The dependent variable defined as $[(M_{ij}-M_{ji})/((Pop_i+Pop_j)*0.5)]*1000000$. The dependent variable is used in column 1 of Table 3.
d. The dependent variable defined as $[(M_{ij}-M_{ji})/(Pop_i*Pop_j)]*1000000*1000000]$. The dependent variable is used in column 2 of Table 3.
e. The dependent variable defined as M_{ij}/POP_j in Equation 4. The dependent variable is used in columns 3and 4 of Table 3.

Table 2: Net-Migration and Population Growth Regressions

	(1) OLS net-migration w/o foreign-born share	(2) IV net-migration w/o foreign-born share	(3) IV population growth w/o foreign-born share	(4) IV net-migration with foreign born share
Diff in immigration rate 1993-07	-4.03** (-2.69)	-5.54** (-2.40)	-7.7E-5 (-0.31)	-4.37* (-1.85)
Diff in % foreign born 1990				-1088.7** (-2.40)
Diff in employment growth 1993-07	29027.3 ** (6.81)	31425.0*** (3.02)	3.65*** (3.20)	13734.0 (1.10)
Diff in Ocean border dummy	1528.8 (1.62)	2079.6* (1.95)	0.15 (1.26)	2051.4* (1.92)
Diff in amenity rank	-696.3 (-1.08)	-940.4 (-0.76)	0.12 (0.88)	2783.3 (1.42)
Diff in ln(1993 wage)	-4299.3 (-1.20)	-9952.6* (-1.92)	-0.13 (-0.22)	17822.1 (1.41)
Adj./Uncent.R^2	0.68	0.67	0.92	0.67
Sample size	49	49	49	49
1st Stage F-Statistic Diff Immigration[a]		8.72 (p=.0000)	8.72 (p=.0000)	10.65 (p=.0000)
1st Stage F-Statistic Diff Employ. Growth[b]		2.66 (p=.036)	2.66 (p=.036)	2.06 (p=0.091)
1st Stage F-Statistic Diff 1993 Wage Level[c]		12.04 (p=.0000)	12.04 (p=.0000)	1.51 (p=.2095)
Cragg-Donald Wald F statistic[d]		1.67	1.67	0.57

Robust t and z statistics are in parentheses. ***, ** and * indicate significant at 1%, 5% and 10% respectively.
a. The joint F-statistic for the five identifying instruments (borders Mexico; 1970 share that is either foreign born, or one foreign-born parent; 1980 foreign-born share, 1993 wage mix, 1993-2007 industry mix job growth) in the first-stage regression for differential 1993-2007 average annual immigration growth.
b. The joint F-statistic for the five identifying instruments (borders Mexico; 1970 share that is either foreign born, or one foreign-born parent; 1980 foreign-born share, 1993 wage mix, 1993-2007 industry mix job growth) in the first-stage regression for differential 1993-2007 employment growth.
c. The joint F-statistic for the five identifying instruments (borders Mexico; 1970 share that is either foreign born, or one foreign-born parent; 1980 foreign-born share, 1993 wage mix, 1993-2007 industry mix job growth) in the first -stage regression for differential 1993 wage level.
d. Cragg-Donald F-statistic for the strength of the instruments across all endogenous variables.

Table 3: Net-Migration and In-Migration Regressions

Variables	(1) IV: Net-migration state by state Eq 2[a]	(2) IV: Net-migration state by state by Eq 3[b]	(3) IV: In-migration state by state[c]	(4) IV: In-migration state by state other than 8 high immig. states[c]
Diff in immigration rate 1993-07	0.012 (0.55)	-0.008 (-0.71)	-0.03 (-0.27)	0.26 (1.42)
Diff in % foreign born 1990	-14.17*** (-3.64)	-4.05** (-2.03)	-139.0*** (-7.24)	-272.7*** (-5.91)
Diff in employment growth 1993-07	126.1 (1.07)	43.8 (0.72)	-2476.1*** (-4.30)	-5604.3*** (-4.84)
Diff in Ocean border dummy	36.8*** (3.91)	12.9*** (2.66)	-127.8*** (-2.74)	-195.2*** (-2.78)
Diff in amenity rank	27.4* (1.5)	6.4 (0.68)	179.7** (2.06)	696.8*** (3.64)
Diff in ln(1993 wage)	99.6 (0.94)	55.4 (1.02)	2497.7*** (4.61)	6212.8*** (4.91)
ln(origin pop93)			267.5*** (10.88)	301.8*** (7.99)
Distance (km)			-0.57*** (-23.3)	-0.67*** (-17.17)
State fixed effect	N	N	Y	Y
R^2/Cent.R^2	0.128	0.035	0.265	0.259
Sample size	1176	1176	2352	1968
Cragg-Donald Wald F statistic[d]	14.79	14.79	29.56	11.30

Robust t and z statistics are in parentheses. ***, ** and * indicate significant at 1%, 5% and 10% respectively.

a. The dependent variable defined as $[(M_{ij}-M_{ji})/((Pop_i+Pop_j)*0.5)]*1000000$.

b. The dependent variable defined as $[(M_{ij}-M_{ji})/(Pop_i*Pop_j)]*1000000*1000000]$.

c. The dependent variable defined as M_{ij}/POP_j in Equation 4.

d. Cragg-Donald F-statistic for the strength of the instruments across all endogenous variables.