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Location Choice of Asian Immigrants in the United States: Do Neighbor Effects Matter?

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Spatial consideration has been neglected in the migration literature. This paper fills the gap by evaluating location choices of Asian immigrants in the United States in a spatial framework. New Asian immigrants from China, India, Japan, South Korea and the Philippines are examined using the American Community Survey (ACS) 1-year Public Use Microdata Sample (PUMS) data for the years spanning 2006 to 2011. Current activity in the United States and national origin are used to divide the immigrants into sub-groups for analysis. Neighbor states' characteristics and spatial dependence (studied in spatial econometrics) are considered. No spatial dependence is detected, except for the Philippine immigrant group. Many immigrants consider not only a state's characteristics but also its neighbor states' characteristics. For some immigrant groups, neighbor states exert strong competing effects, while for other groups, neighbor states' characteristics have complementary effects. In either case, to encourage or discourage certain immigration, state governments will need to consider not only their own conditions but also those of neighbor states, so that they can design and implement the most appropriate immigration policies.

Keywords: *Asian immigrant; location choice; United States; neighbor effect*

Introduction

The immigrant population in the United States hit a record of 41.3 million in July 2013, accounting for 13.1 percent of U.S. residents. Information on the number and characteristics of immigrants is important for state and local governments to prepare for challenges and opportunities lying ahead. This paper analyzes the location determinants of new Asian immigrants' initial settlement among the 48 contiguous states and the District of Columbia and compares their location preferences by national origin and by current activity in the United States. In response to Cushing and Poot (2004)'s call for examining spatial considerations, this paper tests whether or not spatial models are needed in migration research.

The paper provides a review of current literature on location choice of immigrants in the United States, focusing on studies of new immigrants. It then describes the immigrant data analyzed in this study and the distribution of immigrants in the United States. Empirical models, which analyze the relationship between the inflow of immigrants into a state and state characteristics, are followed by a discussion of the estimation results and policy implications.

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Background

Immigrants in the United States have significant impacts on local labor markets, social structures, local and federal governments, and the migration behavior of natives. Both federal and state governments may tailor their economic, welfare and fiscal policies to attract or discourage immigrants (Buckley, 1996). To establish effective policies, it is essential to understand what determines immigrants' settlement choices. The past two to three decades have seen a growth in literature on the determinants of location choice of immigrants, especially new immigrants in the United States. These studies rely on data either from Immigration and Naturalization Services (INS) or the Public Use Microdata Sample (PUMS) of the decennial U.S. census. Walker and Hannan (1989), Dunlevy (1991), Jones (1995), Buckley (1996), Zavodny (1999), Dodson (2001), Kaushal (2005), Scott, Coomes, and Izyumov (2005) and Jaeger (2007) use INS data to examine the location choices of immigrants who were just granted Legal Permanent Resident (LPR) status. In comparison, fewer studies use the decennial census. Bartel (1989) uses PUMS data of the 1980 decennial census to examine the location choices of male immigrants and differentiate immigrants by their arrival time and ethnicity. The group of immigrants that arrived between 1975 and 1979 are considered as new arrivals and their locations in 1980 are considered as the initial locations in the United States. Funkhouser and Ramos (1993) use the 1980 decennial census data to examine the importance of relative earning and culture in the location choice of immigrants from Dominican Republic and Cuba. Newbold (1999) uses PUMS data of the 1980 and 1990 decennial censuses and enables certain temporal dimension in the analysis. The INS data contain individual records on each alien legally admitted for permanent residence. The survey-based decennial census data include more personal attributes for each individual and include any aliens entering the country (legal or illegal, despite no information on which individual is illegal). Each data source has its advantages and disadvantages. Newbold (2000) provides more detailed comparisons between INS data and census data.

Recent studies recognize the nationality-related difference in location choices and typically analyze immigrants' settlement preferences by their country of origin. Jones (1995), Bauer, Epstein, and Gang (2005, 2007), McConnell (2008), and McKenzie and Rapoport (2010) examine Mexican immigrants' location choices. The studies that examine immigrants from Mexico often use the data from Mexican Migration Project (MMP) (e.g., Bauer et al., 2005; 2007; McConnell, 2008). Walker and Hannan (1989), Dodson (2001), Scott et al. (2005) and Kaushal (2005) study immigrants from a wide range of countries , while Dunlevy (1991) focuses on immigrants from 11 Latin American countries; Zavodny (1999) analyzes immigrants from China, the Dominican Republic, Mexico, the Philippines and Vietnam; and Funkhouser and Ramos (1993) examine immigrants from the Dominican Republic and Cuba. According to Pew Research Center (2015), since the Immigration and Nationality Act of 1965 was introduced, the nation's foreign-born population increased from 9.6 million to a record 45 million in 2015. Asians increased from less than 1% of the total population in 1965 to 6% in 2015. Asian immigrants are projected to become the largest immigrant group by 2055 (Pew Research Center, 2015). This paper examines this important immigrant group. Furthermore, it intentionally selects five Asian countries of different levels of economic development that send the most people to the United States: China, India, Japan, South Korea and the Philippines. The comparison of immigrants by their national origin reveals that, despite being all Asians, there are significant differences in initial location choice patterns and geographic concentration.

The importance of personal attributes in determining settlement choices has been noted in several studies. For example, Bartel (1989) found that immigrants with more education rely less on ethnic enclaves and tend to be more dispersed in the country. Bauer et al. (2005) found that

immigrants with good English proficiency choose to migrate to locations with relatively low concentrations of immigrants of similar ethnicity and language, whereas immigrants with poor English proficiency choose to migrate to locations with large networks of migrants of similar ethnicity and language. Scott et al. (2005) concluded that the estimated effects of location factors can reverse as one takes account of the age, gender, marital status and previous occupation of the immigrants. Kaushal (2005) differentiated immigrants by their gender, marital status and skill level, and found that safety-net programs have little effect on the location choices of newly arrived low-skilled unmarried immigrant women. Zavodny (1999) and Dodson (2001) found settlement differences among immigrant groups by legal admission category. This study differentiates immigrants by their current activity in the United States, and examines the settlement differences.

Cushing and Poot (2004) pointed out that rapid developments in spatial econometrics have not yet found much application in migration research. Interaction of destinations or origins has received little recognition in migration studies. Ashby's study (2007) is one exception that included spatial effects in studying migration. He estimated a modified gravity model with cross-sectional data in order to analyze the impact of economic freedom on migration flows among the 48 U.S. states. Does spatial dependence exist in immigrants' location choices? Do immigrants choose where to settle not only based on a state's characteristics, but also based on surrounding states' characteristics? If the answer to the former question is yes, then spatial modeling is needed in the analysis. Omission of spatial dependence may lead to biased and inconsistent coefficient estimates and thus incorrect statistical inferences (Anselin, 1988). If the answer to the latter question is yes, then state or local governments' independent policies may not achieve their expected results, unless cooperative policies are implemented between states. This paper fills the gap in the migration literature by evaluating location choice in a spatial framework.

The Distribution of Asian Immigrants in the United States

Immigrant Data Source

This paper introduces a new data source, the American Community Survey (ACS) Public Use Microdata Sample (PUMS) data, and annual data are available from 2000 to the present. ACS data on immigrants is similar to the decennial census, with some differences on the frequency of the survey and the size of the survey sample; it provides information on a yearly basis about the United States and its people.[2] The PUMS provides a sample of actual responses to the ACS. ACS PUMS files for a year, such as 2010, contain data on approximately 1% of the U.S. population. Similar to PUMS files for a decennial census, ACS PUMS data include all possible individuals (not just legally admitted aliens, but also illegal immigrants) and provide a rich array of information on individuals such as state of residence, sex, marital status, age, citizenship, place of birth, education attainment, work status, income or earnings and migration. Starting in 2006, the ACS has included people living in group quarters facilities and this change must be taken into account in comparing different years of ACS data (U.S. Census Bureau, 2009). To have consistent data over time, this research uses the ACS 1-year PUMS data for the years 2006 to 2011.

[2] For more details on American Community Survey, see the website of the U.S. Census Bureau. https://www.census.gov/programs-surveys/acs/about.html

Much migration research uses cross-sectional data, providing only a snapshot of migration processes, mostly due to limitations of data sources. One main advantage of using ACS data is that it provides annual data on migration, which allows a time dimension in this strand of research. A one-time snapshot may provide biased information and cannot capture dynamics. For example, Idaho was among the seven largest states receiving Japanese immigrants in 2011, but it did not receive any Japanese immigrants in 2010. A cross-sectional view of either 2010 or 2011 migration can give us biased information. In terms of estimation, now panel data estimation approach can be used and fixed state effects can be included. Fixed state effects can capture the time-invariant unobservable or hard-to-measure factors that influence immigrants' location preferences, such as state immigration policies and attitudes toward immigrants, education quality and amenities.

Construction of Observation Samples

For each observation year, I formed the initial sample from the ACS 1-year PUMS data person record[3], limiting it to new Asian immigrants from China, India, Japan, South Korea and the Philippines ages 16 to 59 who live in the 48 contiguous states and the District of Columbia[4], and constructed immigrant cohorts of each origin country. With the person weights provided in the ACS PUMS, I generated gross migration flows into each state for each observation year. PUMS estimates are expected to be different from published ACS estimates that are based on a full set of data because of the additional sampling (U.S. Census Bureau)[5]. But PUMS is more flexible to estimate particular groups of people of interest, such as Japanese people who are ages 30 to 50 and have a Ph.D.

In addition to classifying immigrants by their country of birth, I also stratified immigrants by their current activity in the United States --investors who come to start or expand their own business or to work in family businesses, people who come to seek employment, students who come to attend school, and others.[6] Immigrants citing different activities are expected to have different location preferences and different impacts on the local economy. Immigrant students favoring states with better educational opportunities, for example, are least likely to stay in the initial location in which they settle, and should have the least impact on the local labor market. Immigrants who seek employment or start/expand their own business should favor states with better economic opportunities and have a relatively big impact on the local labor market. However, even these two types of immigrants have various location considerations and various

[3] According to the answers to the ACS question "Where did this person live 1 year ago?" I selected the Asians who lived in China (excluding Hong Kong and Taiwan), India, Japan, South Korea and the Philippines one year before the survey. I then used the answers to the ACS question "When did this person come to live in the United States?" to eliminate the individuals who already lived in the United States more than a year before the survey and the recent entry was not their initial entry to the country. Based on the place of birth question, I further eliminated the individuals who migrated from these Asian countries to the United States, but were not born in those Asian countries, such as Africans coming to the United States from China. Answers to the citizenship question were used to eliminate any U.S. citizens such as people born of American parents in these Asian countries.

[4] For the spatial analysis purpose, this paper follows Ashby (2007) to include only the 48 contiguous states and also includes the District of Columbia as in Dunlevy (1991) and Dodson (2001).

[5] For more details, please check the U.S. census bureau website for frequently asked questions -- Why don't the American Community Survey (ACS) Public Use Microdata Sample (PUMS) file estimates match American FactFinder (AFF) estimates? https://ask.census.gov/faq.php?id=5000&faqId=911

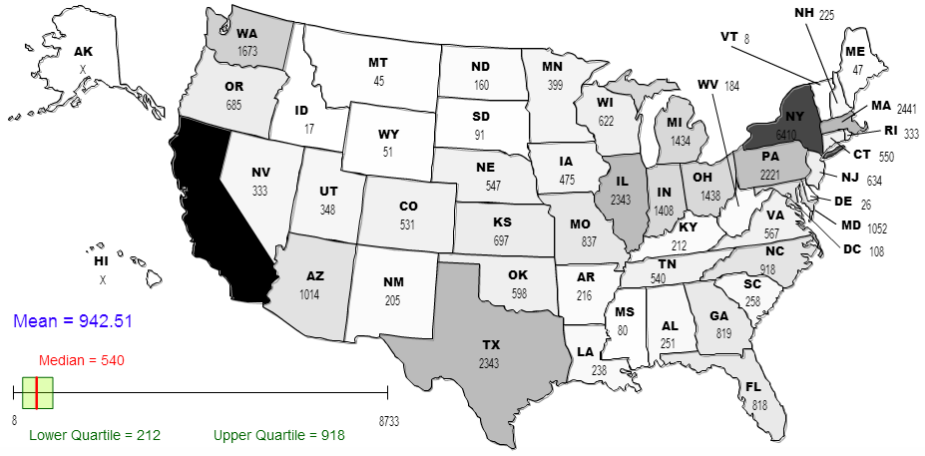
[6] In most cases, the activity within a year after the entry reflects the purpose of coming. Many persons in the "other" activity group may be dependents who did not move for their own career or education.

impacts on the local economy. Immigrant investors who come to start or expand their businesses care about the backward and forward linkages to their businesses. Employment seekers care more about wages and employment opportunities. Understanding the immigrant composition by their activity is important for policymakers to design policies to prepare for or adjust to the social and economic impact of immigration.

Observations

Figures 1-5 show the average annual inflow from 2006 to 2011 of new Asian immigrants from China, India, Japan, South Korea and the Philippines. Table 1 lists the top 10 states receiving the most immigrants of each national origin and reveals the proportion of immigrants received. New Asian immigrants appear to favor the East and West Coasts, the Great Lakes region and Texas. By far, California received the most immigrants from each origin country. Other than the commonalities, there are significant differences in locational preferences across the five national origins. Chinese immigrants favor the Great Lakes region more than any other Asian immigrants. Indian immigrants have a higher preference than other immigrant groups for New Jersey, Texas and Illinois. Philippine immigrants also have a high preference for Texas and Illinois, but their exceedingly high preference for California is incomparable. Similar to Chinese immigrants, Japanese immigrants favor New York significantly.

Figure 1: Average annual inflow of new Chinese immigrants by state, 2006-2011[7]



[7] This figure and the following seven figures are created by the author, using 1-year ACS PUMS data files from 2006 to 2011. The number in each state reflects the average value over the observation years. A darker shade correspond to a larger value.

Figure 2: Average annual inflow of new Indian immigrants by state, 2006-2011

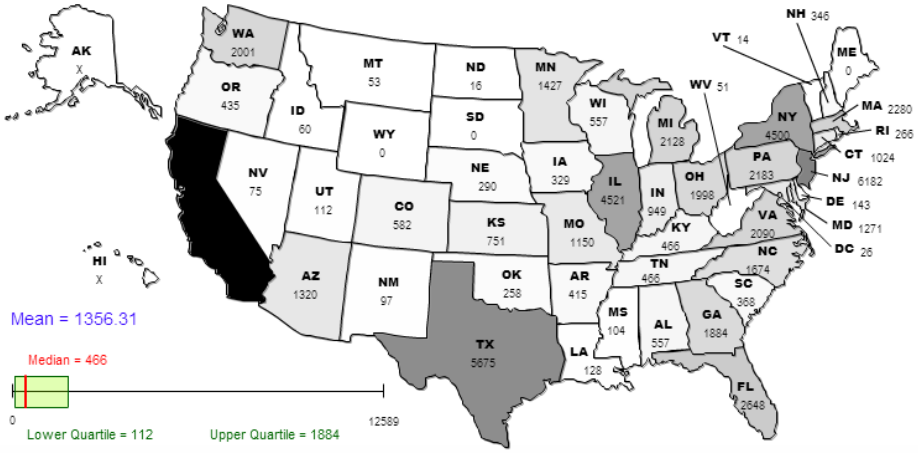


Figure 3: Average annual inflow of new Japanese immigrants by state, 2006-2011

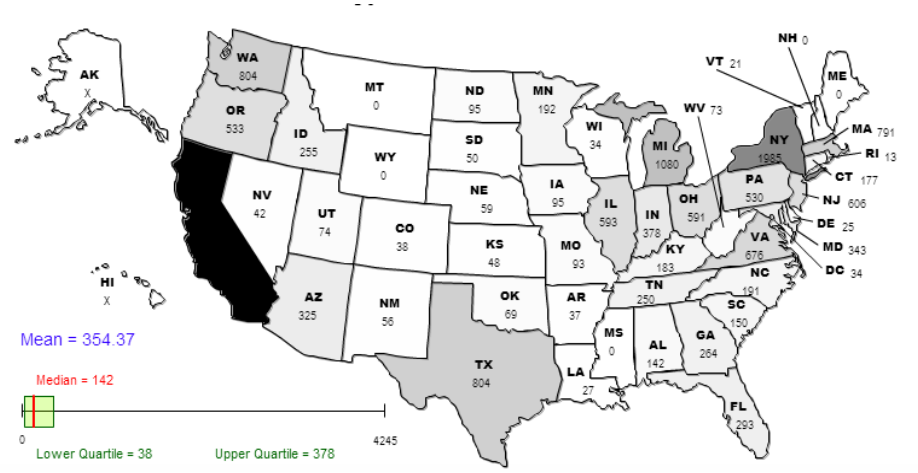


Figure 4: Average annual inflow of new Korean immigrants by state, 2006-2011

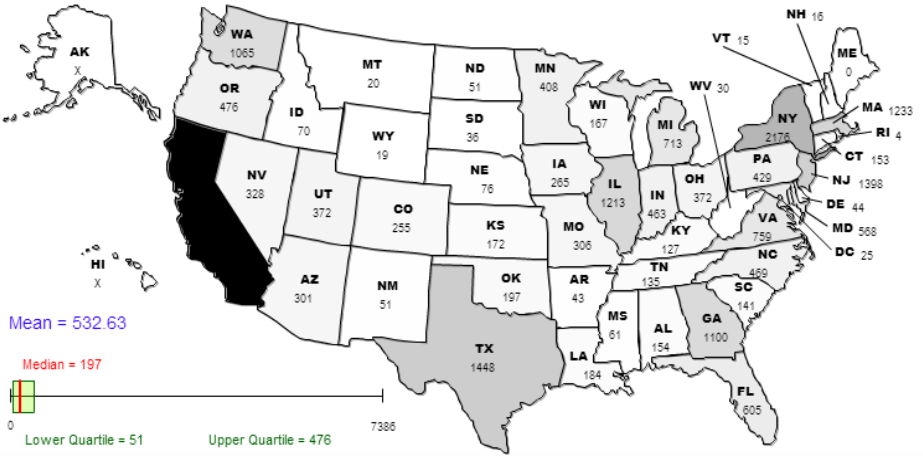


Figure 5: Average annual inflow of new Philippine immigrants by state, 2006-2011

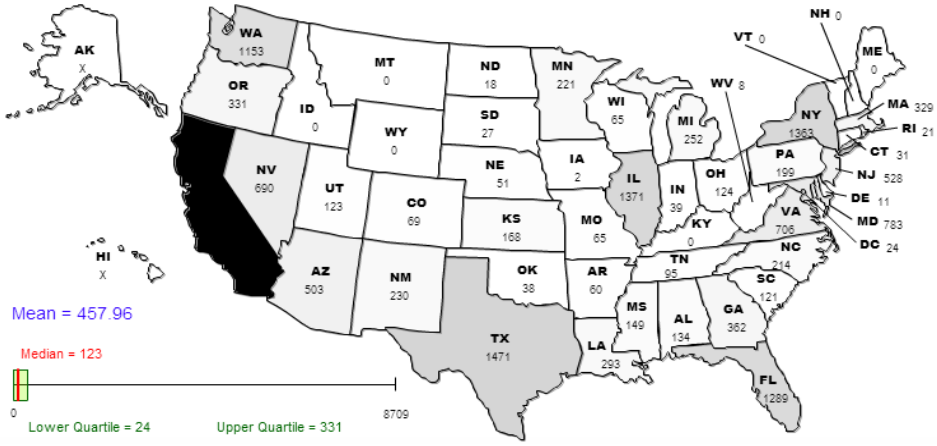


Table 1 sheds light on the geographic concentration of these immigrants. Philippine immigrants appear to have the highest geographic concentration. Thirty-nine percent of new Philippine immigrants cluster in California and 64% cluster in the five most attractive states. This view of geographic concentration reveals that other Asian immigrants are less clustered, with Chinese being the least concentrated geographically. Nineteen percent of new Chinese immigrants choose California and 48% choose the top five states. Indian immigrants have about the same concentration level in California as Chinese immigrants, yet the concentration in the top five states is a bit higher. Korean and Japanese immigrants are only slightly more concentrated in the top five states than Indian immigrants, but much more concentrated in California.

According to Table 2, 63% of Indian, Japanese or Philippine immigrants come to seek employment. A much smaller proportion of Chinese or Korean immigrants (39% for Korean and 49% for Chinese) come to seek employment, as many of them come to pursue education. Only 2-4% of Asian immigrants come to start their own business or work in family businesses.

Table 1: Percentage of immigrants in top 10 states by national origin from 2006-2011

China		**India**		**Japan**	
California/CA	19	California/CA	19	California/CA	24
New York/NY	14	New Jersey/NJ	9	New York/NY	11
Massachusetts/MA	5	Texas/TX	9	Michigan/MI	6
Illinois/IL	5	Illinois/IL	7	Washington/WA	5
Texas/TX	5	New York/NY	7	Texas/TX	5
Pennsylvania/PA	5	Florida/FL	4	Massachusetts/MA	5
Washington/WA	4	Massachusetts/MA	3	Virginia/VA	4
Ohio/OH	3	Pennsylvania/PA	3	New Jersey/NJ	3
Michigan/MI	3	Michigan/MI	3	Illinois/IL	3
Indiana/IN	3	Virginia/VA	3	Ohio/OH	3
South Korea		**Philippines**			
California/CA	28	California/CA	39		
New York/NY	8	Texas/TX	7		
Texas/TX	6	Illinois/IL	6		
New Jersey/NJ	5	New York/NY	6		
Massachusetts/MA	5	Florida/FL	6		
Illinois/IL	5	Washington/WA	5		
Georgia/GA	4	Maryland/MD	3		
Washington/WA	4	Virginia/VA	3		
Virginia/VA	3	Nevada/NV	3		
Michigan/MI	3	New Jersey/NJ	2		

Table 2: The composition of immigrants by national origin and current activity

National Origin	To work for the government or companies or non-profit organizations	To be self-employed or work in family businesses	To attend school	Other
China	49	2	30	19
India	63	2	9	26
Japan	63	2	17	18
South Korea	39	4	30	28
Philippines	63	3	6	28

Note: All numbers are percentages

Figures 6-8 reveal that among these U.S. states, Maine and West Virginia tend to attract working professionals. All Asian immigrants coming to Maine during the observation years are employed by the government, companies or non-profit organizations. North Dakota, Washington DC and Vermont tend to attract Asian students. For all states, the share of new immigrants that are self-employed or working in family businesses is quite small (no larger than 6%). Wisconsin, Washington DC and Washington state tend to attract such immigrants, while 14 states (e.g., Wyoming, Rhode Island, Vermont, Connecticut) do not receive any such immigrants.

Figure 6: Proportion of new Asian immigrants who are employed by the government, private companies or non-profit organizations

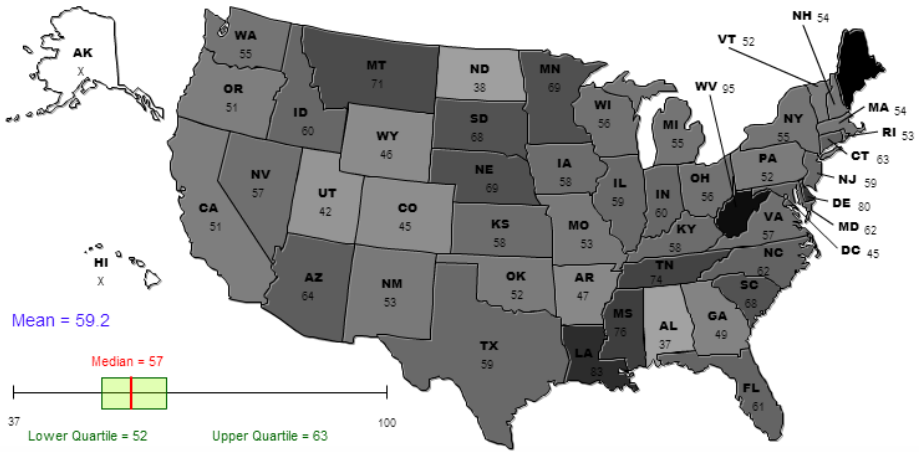


Figure 7: Proportion of new Asian immigrants who are self-employed or work in family businesses

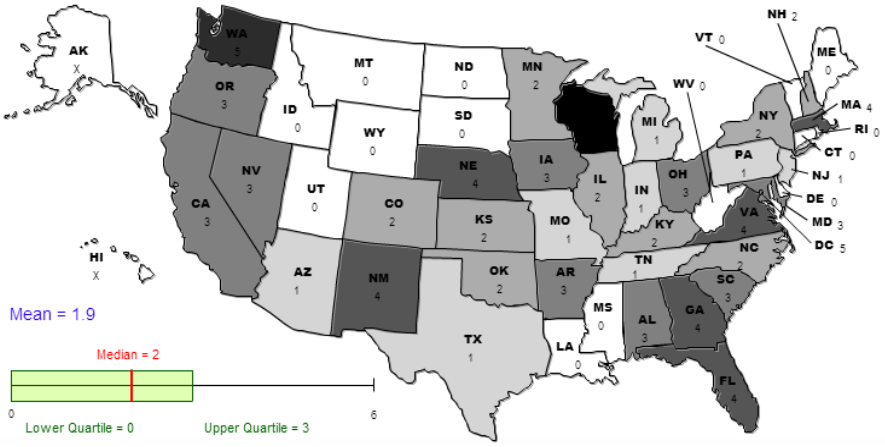
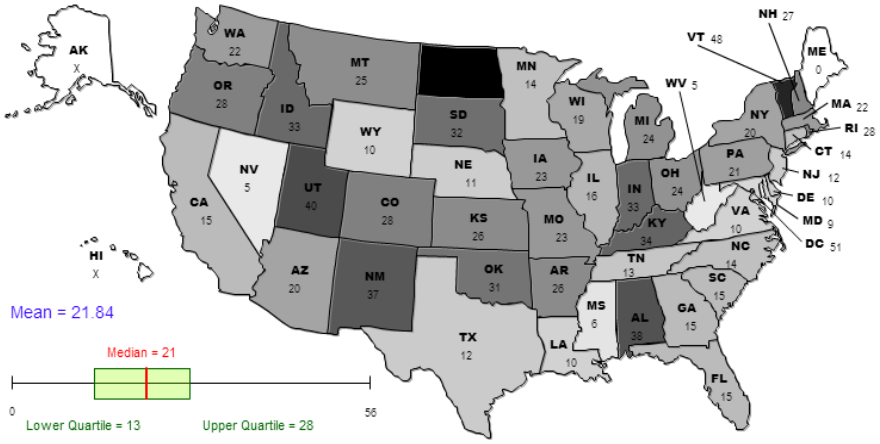


Figure 8: Proportion of new Asian immigrants who are attending schools



The Models and Variables

Benchmark Model

Studies of gross migration formulate their models either explicitly or implicitly in the context of individual utility maximization (Greenwood, 1975). An individual's utility of migration is determined by three categories of factors: 1) the socioeconomic conditions in the destination that attract people, i.e. the 'pull' factors; 2) the socioeconomic conditions in the origin that pushes out people, i.e. the 'push' factors; and 3) migrants' personal attributes such as age, sex and education. Aiming to provide state and local governments with immigrant information and policy suggestions, this study focuses on the 'pull' factors and examines the location choice patterns of new arrivals from the five Asian sending countries. To take into account the impact of immigrants' personal attributes, this study categorizes the new arrivals by their individual characteristics and analyzes the location choice patterns for each group.

The benchmark model follows Dunlevy (1991) and relates the number of new arrivals in a given state as a function of the socioeconomic characteristics of the state.

$$M_{it} = \alpha + \beta_1 IMS_{it-1} + \beta_2 AS_{it-1} + \beta_3 POP_{it-1} + \beta_4 IC_{it-1} + \beta_5 UE_{it-1} + \beta_6 HP_{it-1} + u_t + v_i + \varepsilon_{it} \quad (1)$$

where
M_{it} is the number of new arrivals in state *i* in year *t*,
IMS_{it-1} is the number of people born in the same origin country as the new arrivals in state *i* in year *t-1*,
AS_{it-1} is the number of people that are Asian in state *i* in year *t-1*,
POP_{it-1} is the population in state *i* in year *t-1*,
IC_{it-1} is the income per capita in state *i* in year *t-1*,
UE_{it-1} is the unemployment rate in state *i* in year *t-1*,
HP_{it-1} is the housing price in state *i* in year *t-1*,
u_t represents time fixed effects that capture any shocks affecting all the states,
v_i represents state fixed effects that capture any time-invariant factors that are unobserved such as attitudes toward immigrants, state immigration policies, distance between a state and origin country, education quality, and climate, etc.,
ε_{it} is a randomly distributed error term assumed to have standard properties.
i represents the 48 contiguous U.S. states and the District of Columbia.

All variables are expressed in natural logarithms. As a result the coefficients are interpreted as elasticities. All the explanatory variables are lagged by one time period to avoid the potential simultaneity problem. Due to the fact that demographic variables, *IMS* and *AS*, are constructed from ACS data, the lagging of explanatory variables causes the analysis to lose one year of observation, and thus *t* ranges from 2007 to 2011.

The explanatory variables are selected out of the following considerations. The literature has shown that network effect or "family and friends" effect is one of the most important determinants of immigrants' location choices (e.g. Bartel, 1989; Dunlevy, 1991; Zavodny, 1999; Jaeger, 2007). Immigrants prefer locations with a larger group of people of their own origin. People of one's own origin, especially family and friends, ease the adjustment to the new, unfamiliar society, lower the psychic cost associated with migration, lower the information cost of the new country and help in the obtainment of employment opportunities. Bartel (1989) shows that the more highly educated migrants rely less on this network effect. IMS is generally expected to have a positive coefficient.

Considering labor market competition, cultural assimilation and other social concerns, immigrants' location choices may be affected by the ethnicity composition of the location. Dunlevy (1991) includes the percent black to reflect Caribbean and Latin immigrants' labor market interaction with African Americans and their racial attitudes. To capture similar effects, this study includes the number of Asians. Depending on the magnitude of competitive and complementary effects, the coefficient sign of AS can be either positive or negative.

The state population is included to reflect the economic size, general economic activity and availability of job opportunities and amenities. A positive coefficient sign is expected.
Per capita income, housing price and unemployment rate are included to reflect economic conditions. Immigrants are attracted to locations where they expect to earn higher incomes, and thus per capita income is expected to have a positive coefficient sign. All else equal, people avoid higher cost of living. However, data on cost of living at the state level is hard to obtain. This

research uses housing price to reflect the cost of living, which is expected to have a negative coefficient sign. According to Harris-Todaro (1970) model of internal migration in developing nations, unemployment rate reflects the chance of finding employment. A higher unemployment rate in the new location means a lower chance of getting employed there. Many researchers have applied the same idea to the analysis of immigrants' location choice. But Bartel (1989) points out that geographic unemployment difference is known to persist in equilibrium and is likely to be utility equalizing, and thus the sign of unemployment rate cannot be predicted.

Unlike many previous studies, this research does not include variables to reflect a state's welfare benefits, because many of the new immigrants under observation have not qualified for welfare benefits.

This research examines immigrants by their country of origin and by their current activity in the United States, and stratifies the immigrants accordingly. Each group of immigrants is regressed upon the same set of state characteristics. Descriptive statistics and data sources of the variables are summarized in Table 3.

Table 3: Descriptive statistics of the variables

Variables	Mean	Std. Dev.	Minimum	Maximum
(1) # of new arrivals from China	5.342	2.604	0.000	9.613
(2) # of new arrivals from India	5.058	3.168	0.000	9.810
(3) # of new arrivals from Japan	3.294	2.955	0.000	8.459
(4) # of new arrivals from South Korea	4.089	2.927	0.000	9.034
(5) # of new arrivals from Philippines	3.256	3.012	0.000	9.276
(6) # of new arrivals who come to seek employment	6.164	2.562	0.000	10.258
(7) # of new arrivals who come to start own businesses or work for family businesses	1.904	2.519	0.000	7.283
(8) # of new arrivals who come to study	4.873	2.665	0.000	9.190
(9) # of new arrivals who don't come to work or invest or study	4.370	3.102	0.000	9.697
(10) # of Chinese	9.070	1.495	4.913	13.136
(11) # of Indians	9.203	1.862	0.000	12.886
(12) # of Japanese	7.596	1.773	0.000	11.677
(13) # of Koreans	8.718	1.570	2.996	12.760
(14) # of Filipinos	8.858	1.551	4.564	13.617
(15) # of Asians	11.342	1.455	8.257	15.422
(16) total population	15.154	1.018	13.167	17.436
(17) income per capita	10.548	0.164	10.237	11.174
(18) housing price	12.244	0.367	11.645	13.300
(19) unemployment rate	1.760	0.390	0.956	2.625

Notes: 1. All variables are expressed in natural logarithms. The number of observations is 245. This is based on a balance panel with 49 cross sections (the 48 contiguous states and the District of Columbia) and 5 years.

2. Data sources: Variables (1) – (15) are from U.S. Census Bureau American Community Survey PUMS data; Variables (16) and (17) are from the Bureau of Economic Analysis (www.bea.org); Variable (18) is from *www.fhfa.gov/webfiles/17330/State_statistics_for_download.xls*; Variable (19) is from the Bureau of Labor Statistics (www.bls.org).

Spatial Considerations

Do Neighbor Conditions Matter?

If immigrants' choice of a state is influenced by surrounding states' socioeconomic conditions, then a state or local government focusing only on its own conditions to design immigration policies may not achieve the expected effects. To explore neighbor effects, this study augments the benchmark model with neighbor states' characteristics, as follows.

$$\boldsymbol{M_t} = \alpha + \beta_1 \boldsymbol{IMS_{t-1}} + \beta_2 \boldsymbol{AS_{t-1}} + \beta_3 \boldsymbol{POP_{t-1}} + \beta_4 \boldsymbol{IC_{t-1}} + \beta_5 \boldsymbol{UE_{t-1}} + \beta_6 \boldsymbol{HP_{t-1}} + \alpha_1 \boldsymbol{W_t} \cdot \boldsymbol{IMS_{t-1}} + \alpha_2 \boldsymbol{W_t} \cdot \boldsymbol{AS_{t-1}} + \alpha_3 \boldsymbol{W_t} \cdot \boldsymbol{POP_{t-1}} + \alpha_4 \boldsymbol{W_t} \cdot \boldsymbol{IC_{t-1}} + \alpha_5 \boldsymbol{W_t} \cdot \boldsymbol{UE_{t-1}} + \alpha_6 \boldsymbol{W_t} \cdot \boldsymbol{HP_{t-1}} + \boldsymbol{u_t} + \boldsymbol{v} + \boldsymbol{\varepsilon_t} \quad (2)$$

where each variable is a 49 x 1 vector, for example,

$\boldsymbol{M_t} = (M_{1t}, M_{2t}, \dots, M_{49t})'$.
$\boldsymbol{\varepsilon_t} = (\varepsilon_{1t}, \varepsilon_{2t}, \dots, \varepsilon_{49t})'$ *and* ε_{it} *is i.i.d. across i and t with zero mean and variance* σ_0^2.
$\boldsymbol{v}$ is a 49 x 1 vector of fixed state effects.
$\boldsymbol{u_t}$ is a 49 x 1 vector of fixed time effects.
$\boldsymbol{W_t}$ is an 49 x 49 non-stochastic spatial weight matrix that generate spatial dependence across states.

To be more specific on the spatial weight matrix for any year *t*, $\boldsymbol{W_t}$ is defined as:

$$W_t = \begin{pmatrix} 0 & w_{1,2} & \dots & w_{1,49} \\ w_{2,1} & 0 & \dots & w_{2,49} \\ \vdots & \vdots & \ddots & \vdots \\ w_{49,1} & w_{49,2} & \dots & 0 \end{pmatrix}$$

where $w_{i,j}$ defines the functional form of the spatial weight between any pair of states *i* and *j*.

The spatial weight matrix defines how the states are spatially related. The spatial weight matrix used in this study assumes that a given state is influenced by all its adjacent states with the power of influence determined by the inverse distance. The distance between two states is defined as the distance between the largest cities (in terms of population size) of the two states. The product of spatial weight matrix and state characteristics gives the spatially weight average of neighbor states' characteristics. For example, $\boldsymbol{W_t} \cdot \boldsymbol{HP_{t-1}}$ reflects the average housing price in neighbor states in year *t-1*.

Spatial Error Model

Spatially auto-correlated stochastic shocks may exist due to common shocks, transmission of shocks, unobserved characteristics that are spatially related, and/or measurement errors[8]. When spatial dependence in the error term is present yet not accounted for, statistical inferences may be misleading (Anselin, 1988, p. 109). This study formulates the following spatial error model to test for and account for (if necessary) the spatial dependence. Likelihood ratio tests developed by Debarsy and Ertur (2010) help determine whether spatial autocorrelation exists in the error term and whether spatial econometric estimation is needed.

[8] With the use of spatial data, measurement errors are likely to systematically vary across space, leading to the need for including spatial errors (Anselin, 2006).

$$\boldsymbol{M_t} = \alpha + \beta_1 \boldsymbol{IMS_{t-1}} + \beta_2 \boldsymbol{AS_{t-1}} + \beta_3 \boldsymbol{POP_{t-1}} + \beta_4 \boldsymbol{IC_{t-1}} + \beta_5 \boldsymbol{UE_{t-1}} + \beta_6 \boldsymbol{HP_{t-1}} + \alpha_1 \boldsymbol{W_t} \cdot \boldsymbol{IMS_{t-1}} + \alpha_2 \boldsymbol{W_t} \cdot \boldsymbol{AS_{t-1}} + \alpha_3 \boldsymbol{W_t} \cdot \boldsymbol{POP_{t-1}} + \alpha_4 \boldsymbol{W_t} \cdot \boldsymbol{IC_{t-1}} + \alpha_5 \boldsymbol{W_t} \cdot \boldsymbol{UE_{t-1}} + \alpha_6 \boldsymbol{W_t} \cdot \boldsymbol{HP_{t-1}} + \boldsymbol{u_t} + \boldsymbol{v} + \boldsymbol{\epsilon_t} \quad where\ \boldsymbol{\epsilon_t} = \gamma \cdot \boldsymbol{W_t} \cdot \boldsymbol{\varepsilon_t} \qquad (3)$$

Results

The location choices of new arrivals from each of the five Asian countries are analyzed separately based on equations 1 and 2, with estimation results reported in Tables 4 and 6 respectively. It is noteworthy that in Table 4, Panel A population has a negative and significant coefficient for Indian and Philippine groups. According to the data observation in Section 3, immigrants tend to flow into the states with large population such as California, New York, Texas and Illinois. A possible explanation for this unexpected estimation result is that there is little variation in a state's population over the five observation years (despite the good variation across states), and the inclusion of the state-fixed effects disguised the true effect of the state population size on immigrant inflows. To explore this issue, I removed the state-fixed effects and estimated equation 1 again. The results are reported in Table 4 Panel B, which confirmed the previous conjecture. In Panel B, the population size has a positive and significant effect for all immigrant groups. In contrast, the comparison of Panels A and B reveals no change in the statistical inference for the unemployment rate, as a state's unemployment rate experienced large fluctuation during the five observation years that include the severe economic recession. The same finding is shown in all the other estimation tables.

The following result interpretation will be based on the B panels that do not include state-fixed effects. Immigrants with various current activities in the United States are also analyzed separately based on equations 1 and 2, with results reported in Tables 5 and 7 respectively. Spatial tests did not detect the existence of spatial dependence, except for the Philippine immigrant group. Therefore, spatial econometric estimation[9] of equation 3 is only applied to the Philippine immigrant group. Overall, both models (with or without neighbor characteristics) performed the best for the Chinese immigrant group. However, when spatial dependence is controlled for the Philippine group, the model with neighbor characteristics performed better for the Philippine group than the Chinese group. Augmenting the benchmark model with neighbor characteristics produced somewhat different results. More specifically, after including neighbor factors, the statistical inference for the housing price changes for quite a few estimations, and the income per capita becomes significant for the Philippine immigrants.

[9] Spatial econometric estimation follows the quasi-maximum likelihood methodology developed by Lee and Yu (2010).

Table 4: Benchmark model estimation results for immigrants of five different origins

	China		India		Japan		South Korea		Philippines	
	Coeff.	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*
Panel A										
People from own origin	-0.054	-0.182	0.110	0.642	0.159	0.977	0.004	0.015	0.019	0.072
Asians	0.149	0.488	-0.204	-0.952	-0.307	-1.529	-0.081	-0.247	-0.090	-0.318
Population	-18.315	-1.288	-31.373**	-2.172	11.220	0.638	3.622	0.215	-43.259**	-2.697
Income per capita	2.110	0.254	0.605	0.072	5.423	0.529	20.595**	2.093	-5.975	-0.638
Housing price	-1.323	-0.539	1.111	0.446	-6.900**	-2.262	-1.024	-0.351	1.527	0.554
Unemployment rate	-0.761	-0.448	-1.316	-0.762	-1.866	-0.888	1.765	0.875	-0.067	-0.035
State-fixed effects	yes		yes		yes		yes		yes	
Year-fixed effects	yes		yes		yes		yes		yes	
# of observations	245		245		245		245		245	
Adjusted R2	0.584		0.711		0.506		0.536		0.607	
Log likelihood	-441.009		-444.490		-493.036		-482.947		-469.637	
Panel B										
People from own origin	0.041	0.140	-0.000	-0.002	0.105	0.663	0.123	0.423	0.065	0.239
Asians	0.020	0.064	-0.043	-0.206	-0.241	-1.253	-0.080	-0.254	-0.107	-0.369
Population	1.864***	14.498	2.434**	17.627	1.692***	10.334	2.069***	13.806	2.034***	13.169
Income per capita	3.681***	3.276	4.947***	4.111	2.592*	1.809	2.609**	1.995	0.160	0.119
Housing price	-1.020**	-2.047	-0.861	-1.616	0.034	0.054	0.128	0.221	1.802***	3.017
Unemployment rate	-0.495	-0.879	-0.126	-0.209	0.925	1.286	-1.046	-1.590	-0.614	-0.907
State-fixed effects	no		no		no		no		no	
Year-fixed effects	yes		yes		yes		yes		yes	
# of observations	245		245		245		245		245	
Adjusted R2	0.515		0.623		0.389		0.479		0.478	
Log likelihood	-487.848		-504.928		-547.132		-525.292		-532.597	

Notes: Intercepts are not reported. * Significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Benchmark model estimation results for immigrants with various activities

	Seek employment		**Self-employed**		**Study**		**Other**	
	Coeff.	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*
Panel A								
Asians	-0.020	-0.234	-0.058	-0.595	-0.012	-0.129	-0.055	-0.617
Population	-14.797	-1.099	-1.747	-0.115	-19.278	-1.292	-27.738**	-2.010
Income per capita	16.776**	2.138	-9.091	-1.028	-10.309	-1.186	-4.470	-0.556
Housing price	-2.979	-1.284	0.559	0.214	1.663	0.647	-1.734	-0.729
Unemployment rate	-0.830	-0.516	-2.024	-1.117	0.756	0.424	-0.418	-0.254
State-fixed effects	yes		yes		yes		yes	
Year-fixed effects	yes		yes		yes		yes	
# of observations	245		245		245		245	
Adjusted R2	0.615		0.494		0.563		0.724	
Log likelihood	-428.218		-457.504		-453.263		-434.180	
Panel B								
Asians	-0.047	-0.609	-0.009	-0.109	-0.009	-0.109	0.031	0.377
Population	1.932***	15.871	1.624***	12.190	1.843***	13.585	2.321***	17.713
Income per capita	2.837***	2.670	2.054*	1.766	2.947***	2.489	5.393***	4.714
Housing price	-0.178	-0.378	1.091**	2.118	-0.575	-1.097	-0.515	-1.017
Unemployment rate	-0.876*	-1.641	-0.912	-1.562	-0.084	-0.141	0.310	0.540
State-fixed effects	no		no		no		no	
Year-fixed effects	yes		yes		yes		yes	
# of observations	245		245		245		245	
Adjusted R2	0.551		0.444		0.484		0.645	
Log likelihood	-474.998		-497.066		-501.570		-493.091	

Notes: Intercepts are not reported. * Significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Models with neighbor characteristics (estimation results for immigrants of five different origins)

	China		India		Japan		South Korea		Philippines	
	Coeff.	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*
Panel A										
Own state effects										
People from own origin	-0.109	-0.352	0.092	0.522	0.156	0.934	0.000	0.000	0.051	0.206
Asians	0.181	0.580	-0.187	-0.850	-0.317	-1.495	-0.088	-0.264	-0.102	-0.383
Population	6.336	0.280	-52.450**	-2.250	22.558	0.792	26.599	0.985	-105.862***	-4.234
Income per capita	13.721	1.365	-2.351	-0.228	10.387	0.821	17.928	1.499	-15.622	-1.416
Housing price	-4.723	-1.496	1.636	0.506	-8.106**	-2.059	-2.416	-0.646	3.405	1.013
Unemployment rate	-0.593	-0.340	-1.460	-0.813	-2.130	-0.971	2.278	1.095	0.573	0.308
Neighbor effects										
People from own origin	-0.198	-0.346	0.066	0.192	0.014	0.043	-0.600	-1.084	0.336	0.769
Asians	0.048	0.082	-0.107	-0.271	-0.162	-0.392	0.478	0.772	-0.096	-0.192
Population	-41.257	-1.362	32.348	1.034	-24.601	-0.643	-19.049	-0.527	106.883***	3.314
Income per capita	-42.566***	-2.515	10.803	0.616	-18.222	-0.854	7.610	0.377	41.449**	2.363
Housing price	7.292	1.474	1.293	0.252	4.668	0.747	-0.590	-0.101	-2.941	-0.577
Unemployment rate	-3.015	-0.857	2.182	0.603	1.012	0.229	-4.064	-0.970	1.175	0.326
State-fixed effects	yes		yes		yes		yes		yes	
Year-fixed effects	yes		yes		yes		yes		yes	
# of observations	245		245		245		245		245	
Log likelihood	-436.129		-442.835		-492.036		-479.261		-386.395	
Panel B										
Own state effects										
People from own origin	-0.013	-0.044	0.092	0.554	0.120	0.744	0.094	0.321		
Asians	0.074	0.236	-0.100	-0.478	-0.256	-1.248	-0.109	-0.344		
Population	1.805***	11.647	2.419***	14.751	1.542***	7.828	2.063***	11.550		
Income per capita	5.471***	4.005	3.250**	2.243	3.659**	2.117	3.913***	2.475		
Housing price	-2.056***	-2.632	-0.316	-0.381	-0.856	-0.868	-0.591	-0.653		
Unemployment rate	-0.605	-0.892	-0.915	-1.263	0.506	0.588	-0.522	-0.663		
Neighbor effects										
People from own origin	-0.540	-0.945	-0.088	-0.279	0.028	0.089	-0.404	-0.730		
Asians	0.435	0.748	0.142	0.379	-0.236	-0.585	0.192	0.315		
Population	-0.105	-0.399	0.313	1.129	-0.492	-1.480	-0.340	-1.122		
Income per capita	-4.222**	-1.945	5.249**	2.270	0.222	0.081	-3.098	-1.233		
Housing price	2.050*	1.925	-1.489	-1.309	0.786	0.587	1.355	1.099		
Unemployment rate	0.537	0.458	1.608	1.292	3.602**	2.423	-0.649	-0.476		
State-fixed effects	no		no		no		no		no	
Year-fixed effects	yes		yes		yes		yes		yes	
# of observations	245		245		245		245		245	
Log likelihood	-484.741		-499.478		-542.840				-423.813	

Notes: Intercepts are not reported. Spatial dependence is detected for the estimation for Philippine immigrants, and hence spatial econometric estimation is applied.

* Significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Models with neighbor characteristics (estimation results for immigrants with various activities)

	Seek employment		Self-employed		Study		Other	
	Coeff.	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*	*Coeff.*	*t-stat*
Panel A								
Own state effects								
Asians	-0.026	-0.290	-0.050	-0.488	-0.039	-0.388	-0.082	-0.877
Population	-17.824	-0.841	26.108	1.078	-5.828	-0.244	-41.472*	-1.870
Income per capita	30.005***	3.194	-13.517	-1.260	-5.250	-0.496	-6.183	-0.629
Housing price	-7.091**	-2.417	1.229	0.367	0.967	0.293	-1.923	-0.627
Unemployment rate	-0.387	-0.237	-2.323	-1.245	0.573	0.311	-0.329	-0.192
Neighbor effects								
Asians	0.021	0.123	-0.076	-0.389	-0.195	-1.016	-0.164	-0.923
Population	4.027	0.142	-46.720	-1.441	-24.246	-0.758	29.133	0.981
Income per capita	-40.914***	-2.581	16.452	0.909	-25.095	-1.405	-0.184	-0.011
Housing price	10.351**	2.246	-2.097	-0.398	1.903	0.367	0.845	0.175
Unemployment rate	-2.542	-0.773	2.554	0.680	-1.780	-0.480	-1.822	-0.529
State-fixed effects	yes		yes		yes		yes	
Year-fixed effects	yes		yes		yes		yes	
# of observations	245		245		245		245	
Adjusted R2	0.625		0.494		0.560		0.720	
Log likelihood	-421.566		-454.134		-450.780		-432.552	
Panel B								
Own state effects								
Asians	-0.005	-0.065	-0.034	-0.371	-0.001	-0.008	0.012	0.142
Population	1.904***	13.131	1.577***	9.878	1.767***	10.848	2.389***	15.439
Income per capita	3.474***	2.707	3.004**	2.126	3.757***	2.606	6.754***	4.930
Housing price	-0.402	-0.546	0.642	0.793	-0.944	-1.143	-2.285***	-2.911
Unemployment rate	-1.547**	-2.430	-0.700	-0.998	-0.356	-0.498	0.451	0.663
Neighbor effects								
Asians	-0.049	-0.312	-0.097	-0.554	-0.080	-0.453	-0.191	-1.130
Population	0.450*	1.834	-0.321	-1.188	-0.110	-0.399	-0.225	-0.857
Income per capita	-2.307	-1.132	-1.776	-0.791	-1.319	-0.576	-2.265	-1.040
Housing price	0.861	0.862	0.713	0.648	0.604	0.538	2.667***	2.501
Unemployment rate	-0.168	-0.152	0.583	0.480	1.223	0.987	0.205	0.175
State-fixed effects	no		no		no		no	
Year-fixed effects	yes		yes		yes		yes	
# of observations	245		245		245		245	
Adjusted R2	0.552		0.438		0.477		0.652	
Log likelihood	-472.046		-495.713		-500.594		-488.069	

Notes: Intercepts are not reported.

* Significant at 10%; ** significant at 5%; *** significant at 1%

One important finding, in contrast to past studies, is that the stock of people from one's own origin or ethnicity is not a significant determinant for these immigrants' location choice. Dunlevy (1991) and Zavodny (1999) also studied the immigrants' location choices among the states with a log-linear model, but they used INS data. They both found the presence of other foreign-born persons to be a primary determinant. Dunlevy (1991) used the 1987 cross-sectional data, whereas Zavodny (1999) used 1989-1994 annual data with year and region-fixed effects. I experimented with cross-sectional estimations year by year, and found the stock of foreign-born to be significant for some nationality in some years[10].

Some other location factors are significant in my analysis. One common finding for all of the five Asian groups is that the coefficients of population size and income per capita are positive and significant. While neighbor characteristics are not significant for Korean immigrants, they are important for other Asian groups. Some neighbor factors have significant competing effects on the state of residence for Chinese, Japanese and Philippine immigrants, whereas they display significant complementary effects on the state of residence for Indians. More specifically, higher unemployment rates in neighbor states tend to push Japanese immigrants into the state of residence. Higher income per capita in neighbor states tend to draw Chinese immigrants away from the state of residence. Chinese immigrants appear to be more sensitive to housing prices than other Asian groups. High housing prices in the state of residence has a negative and significant impact on their choice and higher housing prices in neighbor states pushes them into the state of residence. Neighbor income per capita and housing price display the same competing effects on the state of residence for Philippine immigrants as they do for Chinese immigrants. Only the Indian group shows a complementary effect of neighbor's income per capita on the state of residence. Indian immigrants appear to care about the general prosperity of the entire region they reside, not only the state of residence.

A common finding for immigrants with different activities is also that the coefficients of population size and income per capita are positive and significant. In this study, no other location factors are significant for investors (self-employed immigrants) and students. It is possible that investors don't care about any of the other factors or neighbor characteristics. But it is also possible that other factors are not significant because these people are composed of very distinct types. They may be in various kinds of business — opening a restaurant or a barber shop, establishing an import/export company or setting up a U.S. affiliate of a multinational enterprise. Depending on the type of business, investors may care about different location factors and have somewhat opposite choices. Combining them in analysis may not precisely reveal each specific self-employed group's settlement preferences. States with large populations and high income levels usually have more and better schools, which attract student immigrants. It makes sense that unemployment rates or housing prices do not matter much to students in their location choices.

For job seekers, the coefficient of a state's unemployment rate is negative and significant, and neighbor states' population size is positive and significant. It is quite intuitive that job seekers avoid states with high unemployment rates. The population size of a state reflects the state's economic size, general economic activity, and availability of job opportunities and amenities. Residing in a state with a large population and also being close to other states with large populations means an

[10] These estimation results are not reported, but are available upon request.

increased level of total economic activity and job opportunities available around the living area, which attracts job seekers.

Housing price is significant for the other immigrants. Higher housing price in the state of residence tends to push such immigrants away. The housing prices in neighbor states has a competing effect on the state of residence, which means lower housing prices in neighbor states tend to draw such immigrants away from the state of residence.

Conclusions

This paper utilizes ACS PUMS data to examine the location choice patterns of new Asian immigrants from China, India, Japan, South Korea and the Philippines. In the analysis of the location determinants of immigrants, this study uses panel data from five years and 48 contiguous states and the District of Columbia. In contrast to findings in earlier studies, demographic factors, such as the clustering of people from one's own origin, are not statistically significant. Instead, some economic factors matter.

The analysis further incorporates spatial considerations. Neighbor states' characteristics are included and spatial dependence is examined. No spatial dependence is detected, except for the Philippine immigrant group. Neighbor characteristics do reveal certain significance. Many immigrants consider not only a state's characteristics but also its neighbor states' characteristics. For some immigrant groups, neighbor states exert strong competing effects, while for other groups, neighbor states' characteristics have complementary effects. In either case, to encourage or discourage certain immigration, state governments will need to consider not only their own conditions but also those of neighbor states, so that they can design and implement the most appropriate immigration policies.

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