The Effects of Immigration on Housing Market in

The United States

Thura Kyaw Aung

City University of New York: Queens College

Undergraduate Thesis Paper

December 2015

Queens College
65-30 Kissena Blvd.
Flushing, NY 11367
United States

E-mail: tkaung3@gmail.com
The Effects of Immigration on Housing Market in The United States

The paper studies the effect of immigration on the cost of housing rent and housing prices in the United States over the period 2005 – 2010. Between these five years, the United States does not only faces an increase in the number of foreign share in Metropolitan Statistical Areas, but also faces economic recession and “housing-bubble” crisis in 2008. The variation is across cities between the two years. Instrument is based on the number of foreign-born share across cities in the earlier period, 1980. The study shows that the increase in the number of foreign-born share by 1 percentage point increases the cost of housing rent by 1.103 percentage points, and increases the cost of housing prices by 2.111 percentage points. We can imply that immigration accounts for a significant value of the housing market in the United States.

Keywords: housing market, immigration, housing rent, housing prices, United States

Corresponding author:
Thura Kyaw Aung

E-mail: tkaung3@gmail.com
INTRODUCTION

Every year, hundreds and thousands of people apply to become Legal Permanent Residents or naturalized citizens of the United States. It is estimated that immigrants and their new generations will account for as much as two thirds of population growth from 1995 to 2050 (NRC 1997). In 2005, Miami had the highest percentage of foreign-born persons (59% of the population were foreign-born). The effects of immigration will be most noticeable in the areas like Miami, where highest numbers of foreign-born population cluster. High number of immigration can also be seen in other metropolitan areas such as New York, San Francisco, and Los Angeles.

What are the effects of immigration on local economy in the United States? Many economists have responded to this question by analyzing the effects of immigration on labor market. In this paper, I would like to respond the question by addressing the importance of housing market. The increase in population should yield an increase in demand for housing market. In theory, the shift in increase for housing demand should yield higher housing rents and prices on the upward sloping housing supply curve. However, we may also have to consider natives who may emigrate due to higher competition in the labor market, decreasing wages and income, thus decreasing housing demand. Therefore, it is important to study the association between immigration and housing rents and prices, as well as the magnitude.

I extracted micro-data from Integrated Public Use Microdata Series with corresponding yearly samples from American Community Survey (ACS). The data includes information of individuals such as birthplace, city residing, rent, and house value. The micro-data is then collapsed into a dataset set of sum of these individuals and sorted by city. I find that the magnitude of the impact of immigration on housing rents and prices is more significant than the impact on the labor market. An immigration increase on 1 percent in a city’s population were associated with an increase in median housing rent of about 1.15
percentage point, and an increase in median housing prices of about 2.11 percentage point. It is very important to interpret these results as a significant effect of immigration on the housing market.

I use Metropolitan Statistical Area (MSA) fixed-effects regression that is identified by using within-city variation in the foreign-born share between censuses to avoid the endogeneity of immigration with respect to other omitted factors that generate rent growth. I also use instruments based on the immigrants in earlier periods. The results support causality of immigration and housing rents and prices.

The results diverge from the results from literature on the effects of immigration on the labor market (Borjas 1994). The study shows that there is a negative economic association between immigration and wages between 1990 and 2010. However, the study is a theory-based approach, thus does not hold as strong evidence as causality between immigration and labor market. In addition, even the labor supply shock in 1980 in Miami does not show any effect on the wage rates (Card 1990). This maybe due to native emigration due to foreign-born immigration in MSAs, or immigrants are settling in areas with high demand for labor.

The results in this paper provide the literature with additional information and further evidence of the impact of immigration on the U.S. economy. It shows a significant way of immigrants affecting the local economy. The positive effect of immigration on housing rents and prices shows that the number of natives emigrating these areas is undeniably smaller than the number of immigration. It also suggests that the native emigration may be another factor that is driving the housing rents and prices in areas with inelastic housing supply.

The paper is organized as follows. Section 2 explains the relationship between economics and housing prices. Section 3 presents the methodology. Section 4 is a detail explanation of data used. Section 5 explains the results of the paper. Section 6 is the conclusion.
THE ECONOMICS OF IMMIGRATION AND RENTS

There are existing studies on the effect of immigration on the housing markets. Albert Saiz claims that between the years 1985 and 1998, “an immigration inflow that amounts to 1% of the initial metropolitan area population is associated with, roughly, a 1% increase in rents and housing values” (Saiz 2006). In comparison to other metropolitan cities, there was a major housing rent increase in Los Angeles during the years 1967 – 1983 (Muller and Espenhade 1985). Housing prices in Spain increased by 52% between 1998 and 2008. During the period, Spain faces a dramatic increase in the number of immigration, and immigration accounts for the 30% of increase in housing prices (Ortega and Gonzalez 2009). All the reports mentioned above shows that there is a significant impact of immigration on housing markets. However, there are no reports on immigration impact on housing markets in the United States for the recent years (especially right before and after the U.S housing market crisis in 2008). In addition, another study of Saiz provides the evidence of causal relationship between immigration impacts on housing rents in Miami. He uses “Mariel Boatlift” as a natural experiment to study the effects of immigration, which shows an exogenous increase of 9% in Miami’s renter population in a year (Saiz 2003).

There are many challenges in this area of studies. First of all, there could be omitted variables that are affects both immigration and housing costs. Immigrants may want to settle in areas with preferences for existing or better amenities (such as easy access to public transportation) and expectations of future growth. Immigrants may also want to settle in areas with more population of their own race. This could cause endogenity and the significant value would be low. In addition, we also need to worry about the emigration of natives. If the emigration offset immigration inflows “one-for-one”, there would be no increasing demand for housing. However, if we see a positive effect of immigration on housing market, this tells us that the natives emigration maybe smaller than foreign immigration.
METHODOLOGY

I will estimate the effect of immigration on the cost of housing rent. The dependent variable is the annual change in the cost of housing rent. The main explanatory variable is the increase in the foreign-born share of a population in a given city. The regression model for housing cost is as follows:

$$\Delta \ln (R_{it}) = \alpha_i + \alpha_t + \beta \Delta FBSH_{it} + \epsilon_{it}$$  \hspace{1cm} (1)

$\Delta \ln (R_{it})$ is the change in the average rent of housing in a city (subscript i) between the years (subscript t). (City specific factors are represented by $\alpha_i$ and time-variant factors are represented by $\alpha_t$?) The main explanatory variable is represented by $\Delta FBSH_{it}$. It is the change in foreign-born share in the city during a given year, relative to the total population of the city in the same year. $\epsilon_{it}$ represents other omitted variables.

The main coefficient is $\beta$, which shows the magnitude of the effect of immigration on the cost of housing rent. The population of a city would increase to the extent of the increase in numbers of foreign-born share in the city. This would create a positive $\beta$. There is also a possibility that $\beta$ is equal to zero or a negative value, if there is a “one-to-one” or greater emigration of natives to immigrants that would cancel out the increasing population effect. Therefore, the sign and magnitude of the impact of immigration on the housing cost is very ambiguous.

I will also estimate the effect of immigration on housing prices in a similar way. The dependent variable is the annual change in the cost of housing prices. The main explanatory variable is the increase in the foreign-born share of a population in a given city. The regression model for housing price is as follows:
\[
\Delta \ln (P_{it}) = \alpha_i + \alpha_t + \beta \Delta FBSH_{it} + \epsilon_{it} \quad (2)
\]

\(\Delta \ln (P_{it})\) is the change in the average price of housing in a city (subscript \(i\)) between the years (subscript \(t\)). The main explanatory variable is represented by \(\Delta FBSH_{it}\). It is the change in foreign-born share in the city during a given year, relative to the total population of the city in the same year. \(\epsilon_{it}\) represents other omitted variables.

However, the estimation of \(\beta\) in the regression model may face an endogeneity bias. It is difficult to predict the sign of bias. For example, let us say that city \(X\) has better amenities in comparison to other cities. This may attract more immigrants and even natives from other cities to settle in the city. This would increase the demand for housing, increasing the housing costs and creating an upward bias. However, if immigrants (and even natives) choose to settle in areas where housing costs are increasing more slowly there would be a downward bias.

I follow an instrumental variables approach to overcome this endogeneity problem. As approached by Alber Saiz, I instrument the number of foreign-born share in a city using historical data. I assume that the number of immigrants in the earlier period influences the location decision of current immigrants. If this historical data is very far from current period, the geographical distribution should not correlate to the current distribution shock of demand for housing. The literature on the effects of immigration on labor market uses this type of instrument.

The following model is the predictor of the current number of foreign-born share in a given city (subscript \(i\)) during a given year (subscript \(t\)):

\[
Z_{t,t} = \sum \left( \frac{FBSH_{it,0}}{FBSH_{t,0}} \right) \cdot FBSH_t \quad (3)
\]
$FBSH_{i,t_0}$ represents the number of foreign-born persons that settles in city in a base year $t_0$. Therefore, $\sum (FBSH_{i,t_0})$ represents the sum of the share of foreign-born persons that live in a specific city in the base year, which shows the network of immigrants in each city. $FBSH_i$ is the foreign-born share that live in the U.S. in year $t$. As an example, we can say that the number of immigrant connection in the base year predicts the number of immigrants in the U.S. in 2010. In summary, I am instrumenting $\Delta FBSH$ with $\Delta Z$.

3. DATA AND DESCRIPTIVE STATISTICS

3.1 Data Sources and Variable Definition

The two dependent variables consist of housing rent and housing prices are extracted as micro-data from Integrated Public Use Microdata Series (IPUMS) USA. The publicly available data consists of high-precision samples of the American population drawn from fifteen federal census and from the American Community Surveys of 2000-2012. I extracted micro-data of American Community Survey samples for years 1980, 2005 and 2010. The extracted data also includes the birthplace of each person. It is also to be noted that the extracted data is not weighted.

I use the extracted data to collapse it at city level. I created two new variables, foreign born and total population. This gives me the total number of foreign-born population and the population as a whole at city level along with the average cost of housing rent and housing prices in a city.

In addition, some cities that were considered as metro cities in 1980 are not consider as metro in 2005 and 2010, and some cities that were not considered metro are now in the list for 2005 and 2010. Therefore, the instrument does not match for some of the cities. The total number of lacking information on the cities for instrument is 80.
3.2 Descriptive Statistics

Table 1 is the summary statistics for all variables used in the analysis. The number of observations is 360. It includes 180 cities in 2005, and 180 cities in 2010.

The average increase in housing rent across cities between the two years is about $137.20. However, the housing rent decreases by $20.22 in Cape Coral, FL. This is also the minimum change in value of the variable “delta_rent”, which represents the change in housing rent in cities between the two years. The value of housing price fell by $163,597.22. The foreign-born share also decreased by -0.0001768. Although it is not the lowest value of foreign-born share, we can see that there is a decrease in foreign-born share.

The maximum value of “delta_rent” shows the city that has the most increase in housing rent. The city is Corona, CA, and the cost of housing rents increased by $433.64. However, the housing price fell by $190,482. The value of foreign-born share decreased by -0.0577679. This decrease of foreign-born share in Corona, CA is higher than the decrease of foreign-born share in Cape Coral, FL.***

On the other hand, there was a decrease in housing prices across cities between 2005 and 2010 by $14,295.00. The city with the highest housing price fall is Salinas, CA. The price fell by $306,053. This is the minimum value of the variable “delta_valueh”, which represents the change in housing prices in cities between 2005 and 2010. The cost of housing rent in this city increases by $49.66. The foreign-born share in this city decreases by 0.0621347.

The city that has the most increase in housing prices is Washington, DC. The housing price increases by $170,865.65. The cost of housing rent in this city increases by $415.80, and the foreign-born share value increase by 0.010607.
In the effect of immigration on the cost of housing rent estimation (equation 1), we experiment with a dependent variable, the change in the log of the cost of housing rent by city. In Table 1, it shows that, on average, the cost of housing rent increase by $137.20.

On the other hand, we look at our main explanatory variable, the change number of foreign-born share by city. We can see that the average change of foreign-born share across cities is 0.5%, while the average total population change is 17,063. This means that 0.5% of foreign-born share is responsible for this total population change during the period.

In Plot 1 and Plot 2, we can see the graphical illustration of correlation between the number of foreign-born share and the housing rent and price variables. In both plots, the horizontal axis shows the change in foreign-born share between 2005 and 2010, by city. The values range from -10.8 to 11.0 percentage points.

In Plot 1, the vertical axis is the total change in the cost of housing rent during the period. The linear fit is also presented and we can see that it slopes upwards. This shows a positive association between the number of foreign-born share and housing rents. The coefficient on the foreign-born share from the OLS regression also shows that it is significant at the 95% confidence level.

In Plot 2, the vertical axis is the total change in the housing prices during the period. I also present a linear fit and we can also see here that it slopes upwards. The slope is steeper in this plot.

We solve the endogeneity issue by using a variation in the inflow of foreign-born share that may be exogenous to the cost of housing rent and housing prices. We take into account of the fact that immigrants would tend to move to areas where other immigrants have settled previously to generate an instrument variable (Altoiji and Card 1991). Therefore, I use the foreign-born share from an earlier period, 1980, as an instrumental variable. This foreign-born share in 1980 is translated as expected immigration by city. First of all, I assume
that foreign-born values in 1983 are not affected by omitted variables that will impact the
cost of housing rent and housing prices in the future.

RESULTS

In this section, I will provide with a formal analysis by estimating equations (1) and
(2) of the period between 2005 and 2010 and discuss more on dealing with endogenity issues
by using the earlier period, 1980, as instrumental variable.

4.1 Fixed Effects Regression on Housing Rent and Housing Prices

Table 2 shows Fixed-Effects regression related to our variables. In column one, the
dependent variable is the logarithm of the cost of housing rent. The explanatory variable is the
change in foreign-born share across cities. In column two, the dependent variable is the
logarithm of the housing price. The explanatory variable is still the change in foreign-born
share across cities. The specification includes year dummies and city dummies. The number
in column one shows the magnitude of the effect of foreign-born share on the cost of housing
rent. Column two reports the magnitude of the effect of foreign-born share on housing prices.
The regressions are population-weighted. We can also see the heteroskedasticity-robust
standard errors.

The coefficient for the cost of housing rent is 1.103 and it is significant at 95%
confidence level. The coefficient for the housing prices is 2.111 and it is significant at 99%
confidence level. It suggests that a change in foreign-born share by 1 percentage point has a
growth rate of the cost of housing rent by 1.103 points, and also has a growth rate of housing
prices by 2.111 points.
4.2 First-Difference Regression & Instrumental Variable

Table 3 presents the results using the earlier period as instrumental variable. The results are very different from Fixed-Effects Regression. We use first-difference estimator approach to address the problem of omitted variables in our panel data. And we include the instrument variable in our regression.

The dependent variable and independent variables are the same as we have used for Fixed-Effects Regression, but we use the foreign-born share from 1980 as the instrumental variable. The point estimate on foreign-born share effect on the cost of housing rent shows that it is -0.002 (column 1). In column 2, the point estimate on foreign-born share effect on housing prices, is 1.783. This tells us that by using instruments, there is no significance in housing rent. However, the change in housing prices is significant at 90%. Therefore, we can derive that the change in foreign-born share does not have any effects on the cost of housing rent, but an increase in foreign-born share by 1 percentage point does increase the housing price value by 1.783 points.

The IV estimate also tells us that OLS is biased downward. This means that immigrants are more prone to settle in places with low housing prices. As a result, there is a low correlation between immigration and housing price change. When we use an instrumental variable for foreign-born share using the foreign-born share from earlier period, we can see the causal effect of immigration increases the demand of housing, increasing housing prices.

The coefficients in both the Fixed-Effects Regression and First-Difference IV estimates are also described as semi-elasticity of the foreign-born share on the cost of housing rent and housing prices.
CONCLUSION

This paper supports Albert Saiz’s statement that “there is a local economic impact of immigration in American cities” (Saiz 2006). Our Fixed-Effects regression shows that both the cost of housing rents and housing prices increase, due to increase in foreign-born share in the United States. The association between immigration and rents is causal. The magnitude of foreign-born share within a city is associated with the magnitude of the evolution of the cost of housing rent and prices. It also shows that magnitude of emigration is smaller than the magnitude of immigration, thus, increase in the cost of housing rents and housing prices.

Fixed-effects regression control for the city specific amenities and other omitted variables where immigrants settle yields a positive impact of immigration on both the cost of housing rent and housing prices. An increase in foreign-born share of a city by 1 percentage point is associated with the increase in the cost of housing rent by 1.103 percentage points and the increase in housing price by 2.111 percentage points.

Using First-Difference regression, instrumental variable based on the level of foreign-born share in 1980 yields different results. This supports the fact that immigrants tend to settle in areas where the cost of housing rent increases slower. An increase in foreign-born share of a city by 1 percentage point does not have any significant effects on the cost of housing rent. However, it increases the cost of housing price by 1.783 percentage points.

The results of using instrument variable are more robust than the results derived from fixed-effects model without instrumental variables.

In conclusion, homeowners in the United States benefit from the increase of foreign-born share. There effects of immigration on natives population is small as the supply of housing is inelastic, and the increase in housing prices support this fact. We can do further research by including other macroeconomic variables, and also include labor market
variables to compare the numbers and analyze the effects of immigration on local economy and the labor market.
**References**


### TABLE 1
Descriptive Statistics (Pooled Data)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>360</td>
<td>2,008.000</td>
<td>2.503</td>
<td>2,005.000</td>
<td>2,010.000</td>
</tr>
<tr>
<td>Population</td>
<td>360</td>
<td>337,569.000</td>
<td>703,598.000</td>
<td>80,734.000</td>
<td>8,185,314.000</td>
</tr>
<tr>
<td>Foreign-Born</td>
<td>360</td>
<td>76,243.000</td>
<td>258,302.000</td>
<td>1,005.000</td>
<td>3,130,399.000</td>
</tr>
<tr>
<td>Owner</td>
<td>360</td>
<td>171,579.000</td>
<td>276,985.000</td>
<td>26,460.000</td>
<td>2,934,767.000</td>
</tr>
<tr>
<td>Renter</td>
<td>360</td>
<td>153,893.000</td>
<td>414,130.000</td>
<td>6,615.000</td>
<td>5,085,991.000</td>
</tr>
<tr>
<td>Cost of Rent</td>
<td>360</td>
<td>832.500</td>
<td>280.200</td>
<td>404.500</td>
<td>1,874.000</td>
</tr>
<tr>
<td>House Value</td>
<td>360</td>
<td>279,495.000</td>
<td>169,776.000</td>
<td>61,339.000</td>
<td>850,258.000</td>
</tr>
<tr>
<td>Foreign-Born Share (Foreign-Born/Population)</td>
<td>360</td>
<td>0.189</td>
<td>0.126</td>
<td>0.010</td>
<td>0.601</td>
</tr>
<tr>
<td>Log (Rent)</td>
<td>360</td>
<td>6.672</td>
<td>0.319</td>
<td>6.003</td>
<td>7.536</td>
</tr>
<tr>
<td>Log (House Value)</td>
<td>360</td>
<td>12.370</td>
<td>0.584</td>
<td>11.020</td>
<td>13.650</td>
</tr>
</tbody>
</table>
### TABLE 2

Immigrant Inflows, Annual Log Rent and Log Price Changes (2005 - 2010)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Δ Log Rent</th>
<th>Δ Log Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign-Born</td>
<td>1.103**</td>
<td>2.111***</td>
</tr>
<tr>
<td></td>
<td>(0.479)</td>
<td>(0.645)</td>
</tr>
</tbody>
</table>

| Observations       | 360        | 360         |
| R2                 | 0.029      | 0.056       |
| Adjusted R2        | 0.014      | 0.028       |

F Statistic: 5.309** (df = 1; 179) 10.710*** (df = 1; 179)

Note: *p<0.1; **p<0.05; ***p<0.01
<table>
<thead>
<tr>
<th></th>
<th>Δ Log Rent</th>
<th>Δ Log Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foreign-Born</strong></td>
<td>-0.002</td>
<td>1.783*</td>
</tr>
<tr>
<td></td>
<td>(0.310)</td>
<td>(0.919)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.161***</td>
<td>-0.030</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.018)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>360</td>
<td>360</td>
</tr>
<tr>
<td><strong>R2</strong></td>
<td>0.029</td>
<td>0.056</td>
</tr>
<tr>
<td><strong>Adjusted R2</strong></td>
<td>0.014</td>
<td>0.028</td>
</tr>
<tr>
<td><strong>F Statistic</strong></td>
<td>-0.016 (df = 1; 178)</td>
<td>11.850*** (df = 1; 178)</td>
</tr>
</tbody>
</table>

Note: *p<0.1; **p<0.05; ***p<0.01