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IMMIGRATION PARTICIPATION IN THE WORKFORCE

PREPARED BY CIPA CAPSTONE TEAM IN CONSULTATION WITH THE US GOVERNMENT ACCOUNTABILITY OFFICE

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Contents

This research was conducted as part of the Capstone curriculum by a group of three graduate students at the Cornell Institute for Public Affairs (CIPA), Cornell University's MPA program. The research project was developed in consultation with the US Government Accountability Office (GAO) on behalf of their Homeland Security and Justice Team, and focused on immigration participation in the workforce in the United States.

This study was divided into two sections: Part I examined workforce participation trends of citizens and non-citizens across different industries in the United States. In Part II, it studied the micro trends pertaining to specific characteristics of the citizen and non-citizen workers in the United States, and their likelihood of being employed. It delved into the literature and data to answer the following questions:

Part I.
a. Among the industries as classified by the North American Industry Classification System (NAICS), which industries employ the highest percentage of non-citizen workers?
b. How do non-citizens compare to citizens in worker attributes like education level and English proficiency?

Part II:
a. What is the likelihood for a non-citizen to be employed in a given industry, when factors including sex, age, education, English proficiency, years in the US, and place of birth are held constant? How do these trends compare across industries?
b. How different is this trend across the nine different regions within the United States?

- **The highest percentage of non-citizens were employed in Educational Services, and Health Care and Social Assistance industry.** That represented 15.21% of the total non-citizen worker population. Meanwhile, non-citizens were under-represented in Public Administration, and Information and Communication industries.
- **Compared to the non-citizen workers, all of the low skilled, middle skilled and high skilled citizen workers were slightly less likely to be employed.** Low skilled citizen workers were 0.92 percentage points less likely to be employed, compared to non-citizen workers, and for the middle and high skilled ones the likelihood reduced to 0.41 percentage points and 0.12 percentage points respectively.
- **For non-citizens, Professional Services and Education related industries displayed the highest proportion of workers with Bachelor's degree or more; Agriculture and Construction related industries showed the highest proportion of workers with a high school diploma or less.** Among non-citizens, the highest number of people with only a high school degree were employed in the Recreation and Food Services industry, followed by the Construction industry. There were some similarities in traits between the citizen workers and non-citizen workers. Workers with low education level were concentrated in Food Services, Manufacturing, and Construction industries. Workers with a master's or higher degree tended

to work in the Education, Health and Social Services or the Professional, Scientific and Waste Management Services industries.

- **For both citizen and non-citizen workers, as the level of skill (educational attainment) increased, the lesser proficient a worker was in English, the more likely they were to be employed.** This indicated that even though it was important to know English, the level of English proficiency, especially in the high skilled sector did not make a worker more likely to be employed. Also, being proficient in English was more important for the lower and middle skill worker since speaking English increased their likelihood of employment.

- **Compared to people who were born in the Unites States, workers who had some experience in the US were more likely to be employed, however, this likelihood decreased with successive years of having stayed here.** This trend was minutely different for workers with different skill levels and generally, staying in the US, for over 15 years had lesser of an impact on their likelihood of being employed.

- **While most studies and our data indicated that citizens were less likely to be employed than non-citizens, they were still more likely to earn higher wages than their non-citizen counterparts.** Citizens were 36.94 percentage points more likely to earn higher wages compared to non-citizens. As expected middle and high skilled workers were exponentially more likely to earn higher wages. Latin American workers were 1.21 percentage points more likely than US born workers to be employed, but they were 4.57 percentage points less likely to earn higher wages in comparison to the same group.

- **Out of the nine divisions, citizens were less likely to be employed in the Middle Atlantic Division, the East North Central Division, and the West South Central Division, compared to their non-citizen counterparts, when controlling for factors like education, English proficiency, years stayed in the US, and place of birth.** Meanwhile, citizens were 0.53 percentage points more likely to be employed in East South Central Division compared to their non-citizen counterparts.

PROJECT BACKGROUND & METHODOLOGY

This research was conducted as part of the Capstone curriculum by three graduate students at the Cornell Institute for Public Affairs (CIPA), Cornell University's MPA program. The research project, developed in consultation with the US Government Accountability Office (GAO) on behalf of their Homeland Security and Justice Team, focused on immigration participation in the workforce in the United States. This report presented findings from the team's research. The team used a mixed methodology of 1) literature review followed by 2) analysis of microdata from the US Census Bureau for the years 2000, 2005, 2010 and 2015.

The report was divided into two sections: Part I examined workforce participation trends of citizens and non-citizens across different industries in the United States. It also examined how educational qualification and language skills compare between citizens and non-citizens across these industries. Part II analyzed specific characteristics of citizen and non-citizen workers in the United States and their likelihood of employment. This analysis examined patterns in 14 different industries and across 9 regional divisions as classified by the US Census.

INTRODUCTION TO IMMIGRATION PARTICIPATION IN THE WORKFORCE

An alien in the US is defined as a person who is not a citizen or national of the United States (US Department of Homeland Security, 2016). As per the US Census Bureau a person can be a citizen by any of the three qualifications: born on US soil, born outside the US but to American parents, or is a naturalized citizen. An immigrant on the other hand can either be a Lawful Permanent Resident (LPR) or temporary alien on a visa. Therefore, based on a person's legal status in the US, the following distinctions were made:
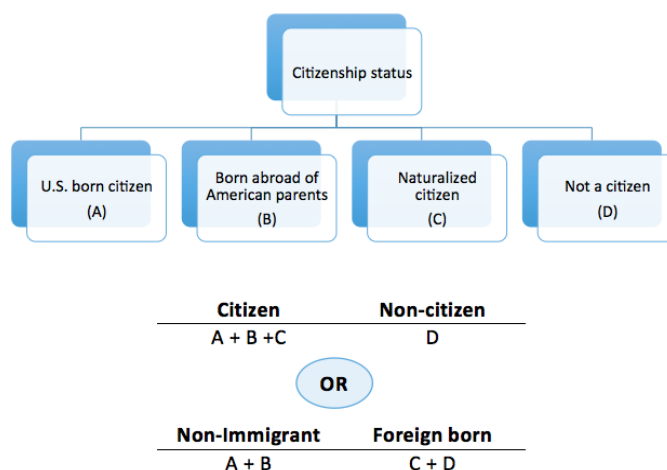
Figure 1

For the purpose of this study, individuals were grouped as citizens and non-citizens. Citizens included naturalized citizens, and non-citizens included both permanent and temporary alien immigrants as defined by the DHS. This grouping was developed from the rationale that the longer

a person has lived in the US, the more likely they are to exhibit similar characteristics as the non-immigrant US workforce. Secondly, legal requirements of visa and government policy for naturalized citizens differ vastly from that for other kinds of immigrants. It is for these reasons that this study followed the citizen and non-citizen classification of a person's legal status.

There is a vast body of work that examined immigrant or non-citizen workers' labor force participation. We relied on this literature to extract factors that recurred in several studies.

ISSUES ADDRESSED IN THIS STUDY

Worker and employment trends differed across industries and across skill and/or qualification levels of individuals. Most studies in the past have concentrated on analysis of either an industry or of a specific skill group; this report focused on analyzing the general characteristics of workers, especially non-citizen workers, in 14 industries with different levels of skillsets, across 9 divisions. This report studied the literature and data to answer the following questions:

Part I.
a. Among the industries as classified by the North American Industry Classification System (NAICS), which industries employ the highest percentage of non-citizen workers?
b. How do non-citizens compare to citizens in worker attributes like education level and English proficiency?

Part II:
a. What is the likelihood for a non-citizen to be employed in a given industry, when factors including sex, age, education, English proficiency, years in the US, and place of birth are held constant? How do these trends compare across industries?
b. How different is this trend across the nine different regions within the United States?

Data Source: The US Census Bureau's micro level data was the source of data for this study. We used the Integrated Public Use Microdata Series (IPUMS) to access the census bureau micro data. IPUMS is the world's largest individual level population database, which consolidates data from the United States Census Bureau. On IPUMS, we created the data extract for our specific research questions, as discussed with GAO team, and analyzed data from four years: 2000, 2005, 2010 and 2015.

The data for 2000 was a 1-in-20 national random sample of the population whereas that from 2005 onwards was a 1-in-100 national random sample. The 2005, 2010 and 2015 data were from the bureau's American Community Survey (ACS) sample since the ACS in its present form was formalized only in 2005. There were slight differences in data coding among the ACS and non-ACS samples, which we have mitigated as far as possible – the biggest difference being that the sample size for 2000 was larger than the others.

Time intervals: Per the literature reviewed, studies generally used 10-year time intervals from the preceding three decades to study immigration trends. However, per our discussions with the GAO, it was crucial for us to look at more recent data; this was also amplified by inconsistencies in the pre and post 2005 ACS data sets. Therefore, while reducing the time intervals from 10 to 5 years, we decided to include data from 2000 onwards to have panel data from four different years for a comprehensive analysis of the research questions.

Terminologies: The first part of our study aimed to analyze the immigration trends in the workforce, across different industries and how these trends differed for people across different skill sets. The following are important phrases and terms used in our study:

- *Labor Force:* Depending on their employment status, individuals are either said to be in the labor force or outside. People in the labor force includes people who are employed and people who are unemployed (US Department of Labor, *n.d.*).

- *Employment & Unemployment:* Employed persons are defines as, "Persons 16 years and over in the civilian non institutional population who, during the reference week, (a) did any work at all (at least 1 hour) as paid employees; worked in their own business, profession, or on their own farm, or worked 15 hours or more as unpaid workers in an enterprise operated by a member of the family; and (b) all those who were not working but who had jobs or businesses from which they were temporarily absent because of vacation, illness, bad weather, childcare problems, maternity or paternity leave, labor-management dispute, job training, or other family or personal reasons, whether or not they were paid for the time off or were seeking other jobs. Each employed person is counted only once, even if he or she holds more than one job. Excluded are persons whose only activity consisted of work around their own house (painting, repairing, or own home housework) or volunteer work for religious, charitable, and other organizations" (US Department of Labor, *n.d.*).
The definition of **unemployment** followed in this study was: those who are able and willing to work and have been looking for work for the past four weeks, with additional qualifications of what exactly looking for jobs entails (US Department of Labor, *n.d.*). Our

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analysis considered all those people in the labor force, whether they were employed or unemployed. People not in the labor force were dropped from our analysis.

- **Citizenship:** The focal independent variable for this study was an individual's citizenship status according to the ACS. A respondent to the ACS survey must choose between the following 4 options while declaring their citizenship status in the US (Integrated Public Use Microdata Series, *n.d.*):
    - A person born in the US, and therefore a citizen at birth;
    - Someone who is born to American parent/s outside the US;
    - A naturalized citizen; and
    - A non-citizen.

  While this was a categorical classification, for this study we converted citizenship into a binary classification. Therefore, either a person was a citizen, falling under any of the first 3 categories as shown in Figure 1, or was not a citizen. This classification was consistently used throughout our data analysis. While comparing immigration and citizenship, the only overlap was with people who were naturalized citizens since they were both citizens and immigrants. However, in consultation with the GAO, this study proceeded on a citizenship classification of an individual's legal status in the United States, as shown in Figure 1.

- **Income:** Income referred to income earned from wages or a person's own business or farm in the previous year (Integrated Public Use Microdata Series, *n.d.*).

- **Age:** This report studied the labor force population of age 16 and above. People above 65 had been kept in the analysis because people not in the labor force were already dropped and therefore it included only the labor force participants older than 65 years of age.

- **NAICS:** For industry classification, this research used the North American Industry Classification System (NAICS). NAICS is used by businesses and governments to classify business establishments according to type of economic activity (process of production) in Canada, Mexico, and the United States of America (North American Industries Classification System, 2017). In line with the data extracted from IPUMS, we focused on 14 of the industry classifications in NAICS. These 14 categories were:
    - Agriculture, Forestry, Fishing and Hunting, and Mining
    - Construction
    - Manufacturing
    - Wholesale Trade
    - Retail Trade
    - Transportation, Warehousing, and Utilities
    - Information and Communications
    - Finance, Insurance, Real Estate, and Rental and Leasing
    - Professional, Scientific, Management, Administrative, and Waste Management Services
    - Educational, Health and Social Services
    - Arts, Entertainment, Recreation, Accommodation and Food Services
    - Public Administration

- Other Services (Except Public Administration)
- Military

- ***Years stayed in the United States:*** This variable indicated how long has a person who was born in a foreign country or US outlying areas, been living in the United States. If the person came to live in the US multiple times, their latest year of entry was used to determine 'years stayed in the US' (Integrated Public Use Microdata Series, *n.d.*).

METHODOLOGY

This part reported on two questions:

a. Among the industries as classified by the North American Industry Classification System (NAICS), which industries employ the highest percentage of non-citizen workers?
b. How do non-citizens compare to citizens in worker attributes like education level and English proficiency?

This study relied on two kinds of evidence: literature review, and data analysis. The methodology and findings of the data analysis are discussed in the subsequent sections.

CURRENT STUDIES AND ANALYSIS - A REVIEW OF THE LITERATURE

The literature we reviewed included official publications of research institutes such as the Migration Policy Institute (MPI) and Brookings Institute; scholarly journal articles; and government fact sheets released by the US Department of Labor and the US Department of Homeland Security. Different literature showed different industry level patterns for employment.

One study based on the 2002 Current Population Survey Data, found that the majority (63%) of foreign-born workers in the US workforce were non-citizens, while 37 percent were naturalized citizens. The author found that non-citizens in the labor force were more likely to be unemployed than either naturalized citizens or native-born workers. In 2002, the unemployment rate for non-citizens in the civilian labor force was 7.9 percent, which was higher than the rate for either naturalized citizens (5.3%) or natives (6.1%). In addition, from 1990 to 2002, the number of non-citizens in the labor force increased from 6.9 million to 12.7 million, while the number of naturalized citizen increased from 4.7 million to 7.6 million. The growth rate of non-citizen labor was 82 percent, which was higher than 62 percent growth rate for naturalized citizens (Grieco, 2004).

Another report found that non-citizen workers were more likely to be male (64%) compared to citizen workers (52%). Within the foreign-born labor force, the characteristics of workers varied. Naturalized citizens were more likely to be older than either non-citizens or native-born citizens in the labor force. In addition, naturalized citizens in the labor force were less likely than native-born workers to have attained a high school diploma (84% and 91%, respectively), while they were more likely than non-citizens (62%). However, naturalized citizens were more likely to have a bachelor's degree or higher education (37%) than either native-born citizens (29%) or non-citizens (21%). In addition, this report found that lower-wage industries tend to hire more non-citizens from the foreign-born labor force than naturalized citizens. The mix of occupations among naturalized citizens was more similar to that among natives than non-citizens (The American Community Survey Report, 2007).

Sumption & Flamm (2012) found that naturalized citizens tend to have higher levels of education and language proficiency than non-citizens. As the authors described, "Non-citizens are about four times as likely as citizens to report not speaking English, and twice likely to report not speaking

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English well." The study also found that because naturalized citizens had higher levels of education, better language skills, and more work experience in the United States, there was evidence that naturalized citizens may earn a wage premium. Different studies estimated the wage premium at 5 percent or more; this was especially true for Latino immigrants and for women.

A 2016 study found that legal status acquisition lead to a 4.2-7.9 percent increase in the wages of immigrant workers who had a high school degree or less. Immigrants with legal status were more likely to move into occupations similar to native-born workers. The study also pointed out that legal status also reduced the manual and communication skill gaps between immigrants and native-born workers by 11-15 percent. Generally, the research found that legal status increased the labor market competition between immigrants and native-born workers (Steigleder & Sparber, 2016).

The literature showed that the immigrant workforce in the science and engineering fields grew from 3.4 million to 5.2 million from 2003 to 2013. A 2015 study that specifically focused on education and employment characteristics found that there were variations in growth by industrial fields. For example, in the field of computer and mathematical sciences, the number of immigrant graduates in the US displayed an increase of 82% over the past 10 years. There was a 45% increase in the number of immigrants with engineering degrees, compared to a 12% increase of their US born counterparts. The research also stated that in 2013, among all scientists and engineers residing in the US, nearly 82% of immigrant engineers were employed, with 3% looking for jobs and 15% not in the labor force. The share was nearly identical for immigrants (82%) and US born scientists and engineers (81%). This indicated that the likelihood of immigrants and US born scientists and engineers being employed was very similar (Lan, Hale & Rivers, 2015).

Singer (2012) analyzed the concentration of immigrant workers in high skill and low skill industries. Singer found that though immigrants represented 15.8% of the civilian employed population in total, they were significantly overrepresented in certain industries, including high-skill industries such as information technology and high-tech manufacturing in which sector they made up 23% of the total US workforce. Immigrants also represented one-fifth of all workers in low skill industries including Construction, Food Service and Agriculture.

Through the literature review, we identified educational attainment, proficiency in speaking English, and years stayed in the US, as important indicators of labor skills and employment. To be sure, those three indicators cannot be perfect measures of skills, and other factors, such as sector specific knowledge and training may affect the same. However, based on a review of the literature, those three indicators were strong predictors of labor skill set and employment.

A study regarding the literacy, numeracy and education of immigrant adults in the US showed three important findings very relevant to our analysis: by analyzing data from the 2012 Program for the International Assessment of Adult Competencies (PIAAC), researchers found, firstly, for both native and foreign born adults, educational attainment had a strong positive correlation with literacy and numeracy scores. The higher the education attainment, the higher the literacy and numeracy scores. Secondly, it found that there was a weak correlation between cognitive skills and employment for immigrant workers; at the similar skill level, immigrants with low English literacy and numeracy proficiency were more likely to be employed than their native-born

counterparts. However, regarding income level, literacy and numeracy skills were strongly associated with differences in income for both immigrants and natives. On average, immigrants earned lesser than their native-born counterparts, but once the literacy and numeracy level was controlled for, the differences significantly decreased. As a result, the study found that most immigrants could find jobs even with low cognitive skills. But higher literacy and numeric skills were necessary for them to earn a higher level of income (Batalova & Fix, 2015).

An empirical study found two factors, 1) immigrant age at arrival, and 2) whether the immigrant's native language was linguistically distant from English, were strongly connected to occupational sorting of immigrants in adulthood in the US. Specifically, it found that children who arrived at an earlier age from English-distant countries tend to develop the similar range of skills as native-born citizens, including communication, math/logic, socio-emotional and physical skills. Those who arrived in US after the primary school years were more likely to choose STEM concentrations over the social sciences and other majors that required greater language and communication skills, which ultimately caused occupational segregation in the labor market (Bacolod & Rangel, 2017).

Another study found that early arrived immigrants had advantages over late arrived immigrants. Specifically, early arrived immigrants were more likely to attain higher levels of education and to be proficient in English, which ultimately caused greater annual wage and salary income advantages, than was the case for late arrived immigrants in the US labor market. Generally, the study implied that the immigrants who arrived earlier on in their childhood tend to have few or no disadvantages in the labor market (Sandford & Seeborg, 2013).

FINDINGS

INDUSTRY AND CITIZENSHIP TRENDS

According to the American Community Survey 2015 data, the highest percentage of non-citizens were employed in the Educational Services, and Health Care and Social Assistance industry, representing 15.21% of the total non-citizen workers, followed by Professional, Scientific, Management, Waste Management Services (14.38%), and Manufacturing industries (11.56%). Non-citizens were under-represented in the Military (.08%), Public Administration (1.24%) and Information & Communication (1.55%) industries. This is shown in Figure 2 below.
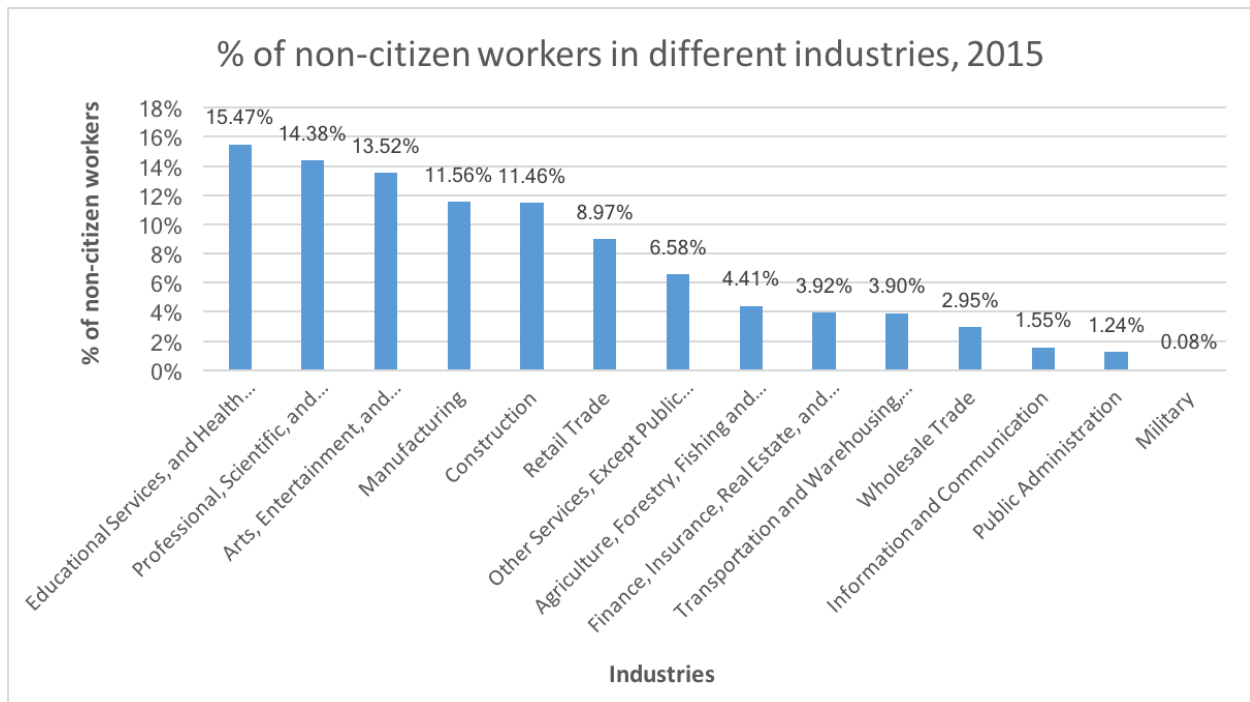
Figure 2

Like non-citizens, the highest percentage of American citizens were employed in the Education Service, and Health Care and Social Assistance industry (24.07%), followed by the Retail Trade (11.17%) and Professional, Scientific, Management, Administrative, and Waste Management Services (11.01%) industries. Citizen workers were under-represented in the Military (.76%), Agriculture, Forestry, Fishing, Hunting and Mining (2.12%), and Information and Communication (2.16%) industries. These results are presented in the Figures 3 below. Detailed findings are presented in Table A1 in the appendix.
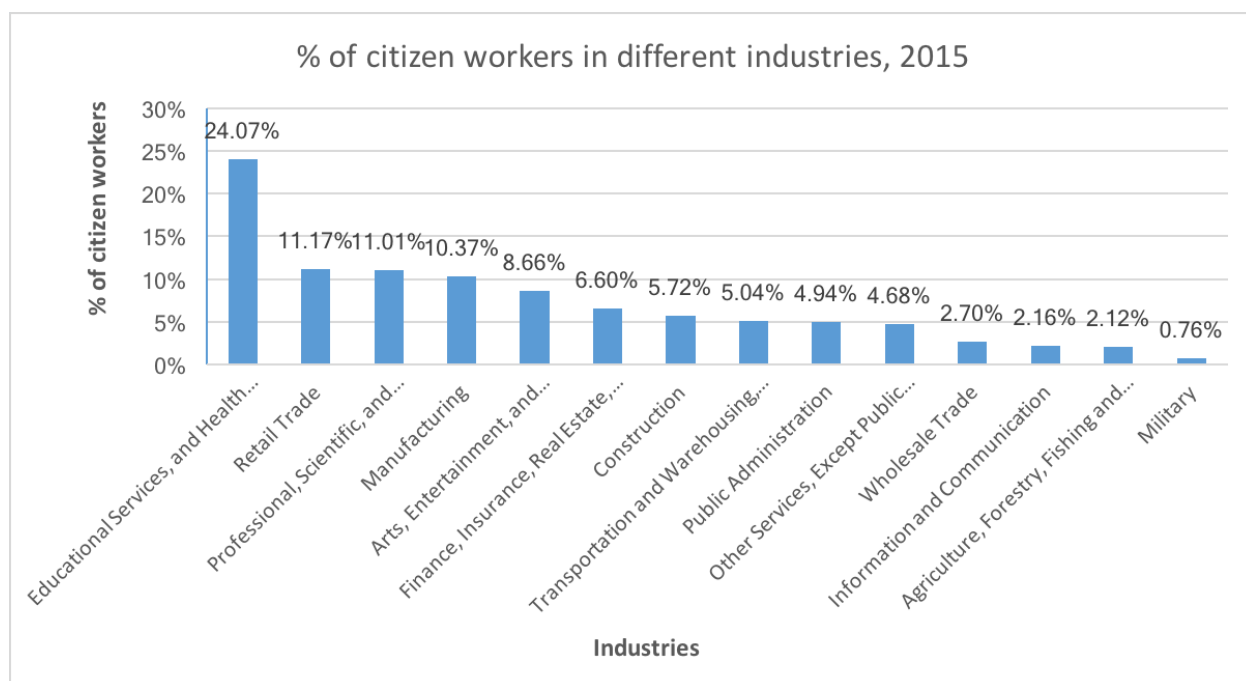
Figure 3

Worker population within the same industry was largely heterogeneous when it came to overall worker attributes which took into consideration factors like educational attainment, years one has stayed in the US, level of proficiency in speaking English and place of birth. However, according to all the literature reviewed, different studies had used different indicators of skills. Hall, Singer, Jong & Graefe (2011) in their study of *The Geography of Immigrant Skills* developed classification of skill based on a person's educational qualifications. A person without a high school diploma was considered to be low skilled, while those with any college or associate degree or above were considered high skilled (Hall, Singer, Jong & Graefe, 2011). We used this definition in our analysis of a non-citizen's likelihood of employment, while controlling for other predictor variables like age, the number of years a person has spent in the US, and their proficiency in speaking English. In this section, we studied industry wide patterns of worker skills and how they differed among citizen and non-citizen workers, within the labor force.

EDUCATIONAL ATTAINMENT

Our data analysis revealed that among non-citizens, Professional Services and Education, Health Services, and Social Services industries displayed the highest proportion of workers with a Bachelor's degree or more; Agriculture was the industry with lowest representation of workers with education above a high school diploma. The trend was similar among citizen workers. Among non-citizen workers, the highest proportion of people with only a high school degree were employed in the Recreation and Food Services industry (15.77%), followed by 15.46% in the Manufacturing industry (Figure 4).

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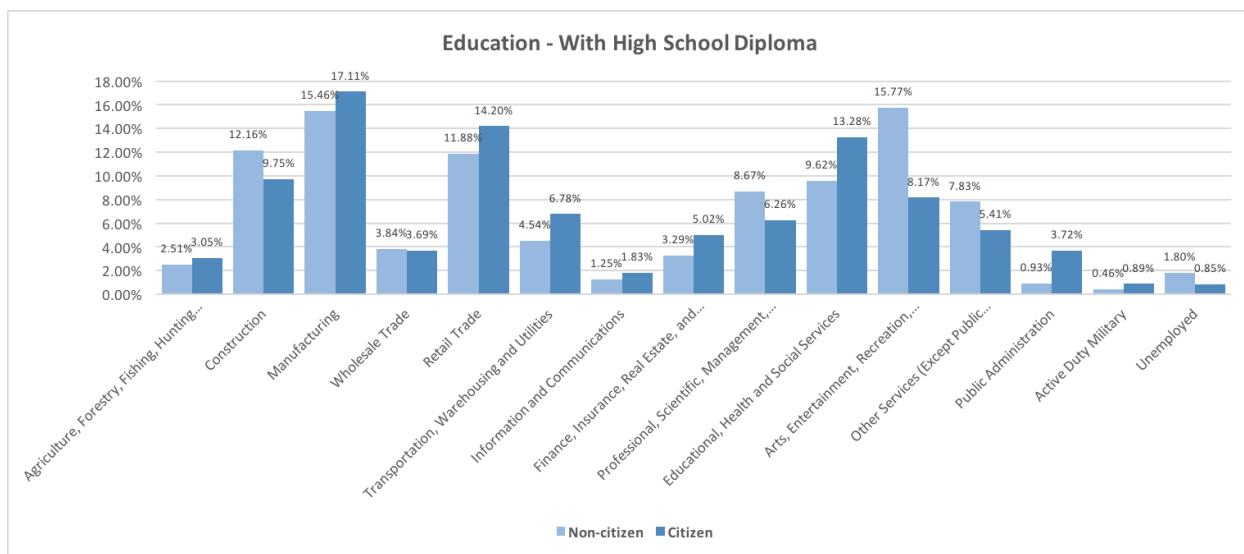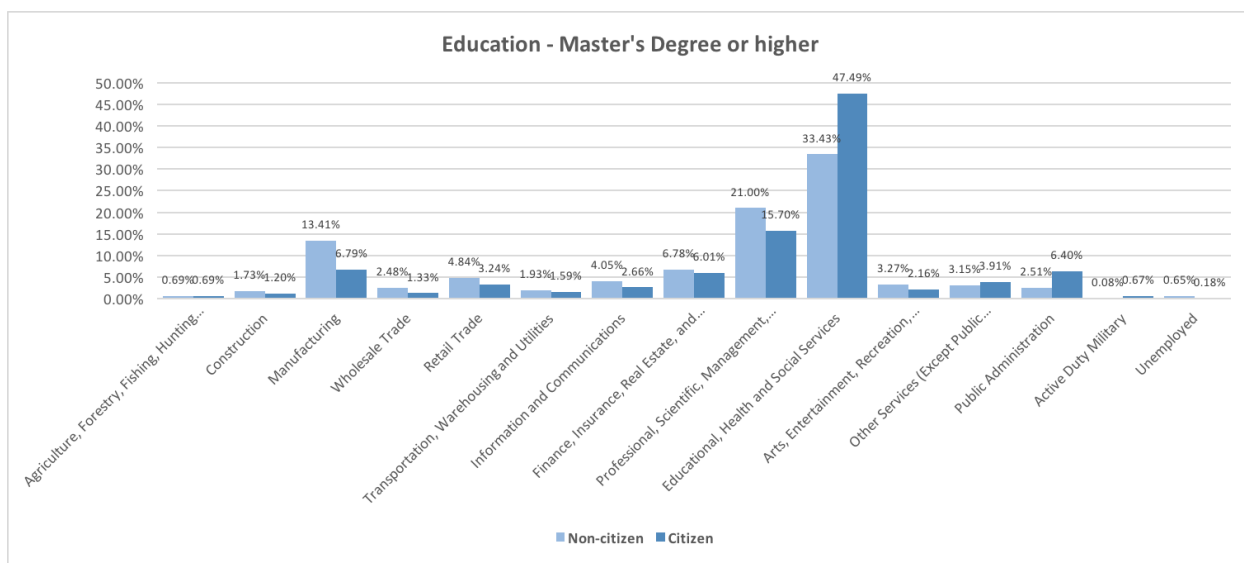
Figure 4

Figure 5

There were some similarities in traits between citizen workers and non-citizen workers. Both citizen and non-citizen workers with low education levels were concentrated in the Food Services, Manufacturing, and Construction industries. Figure 5 above indicated that workers with a master's or higher degree tend to work in the Educational, Health, and Social Services industry (47.49% for citizen workers, and 33.43% for non-citizen workers). Figures A1 – A3 in the appendix below display the industry wide frequency of labor distribution based on educational attainment.

Our analysis revealed that among non-citizens, those who do not speak English were highly concentrated in the Manufacturing industry (19.62%), followed by Construction (15.32%).
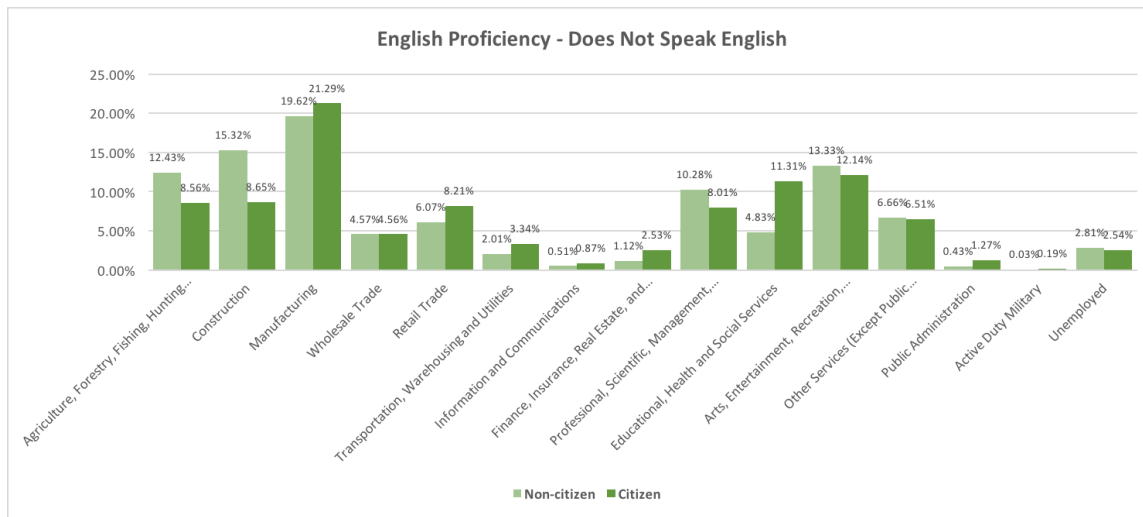
Figure 6

The highest proportion of non-citizen workers with the most basic proficiency in English speaking (who speak English, but not well) were in the Manufacturing industry (18.94%).
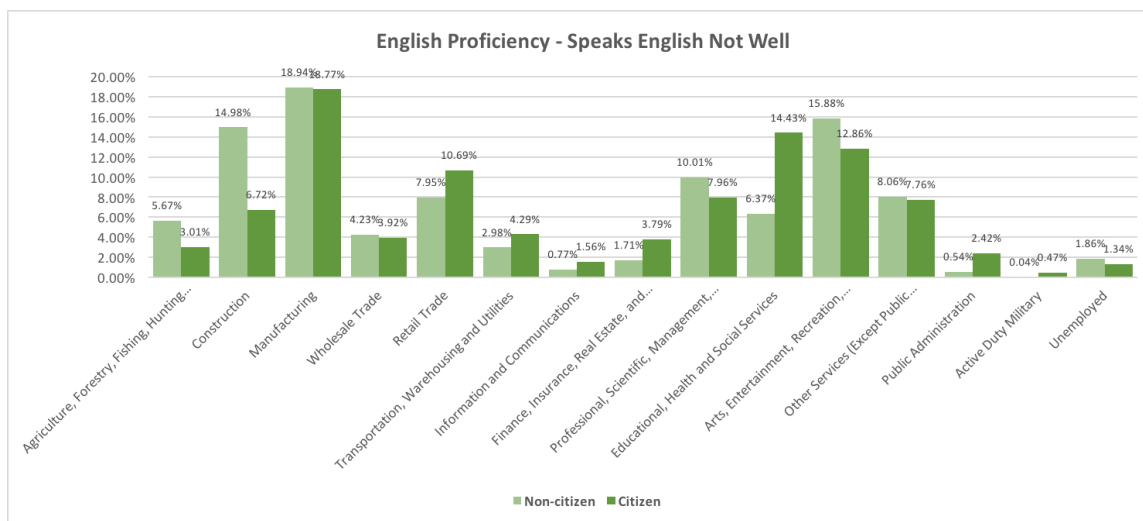
Figure 7

Both citizen and non-citizen workers who speak only English or speak English very well, were concentrated in the Educational, Health, and Social Services industry; 20.91% of non-citizen workers who speak only English and 19.35% of non-citizen workers who speak English very well were employed in this industry. Figures A4 – A6 in the appendix detail these findings. Table A2 in the appendix below displays the absolute numbers for both citizen workers' and non-citizen workers' characteristics within the industries.

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CURRENT STUDIES AND ANALYSIS - A REVIEW OF THE LITERATURE

Part II focused on trends concerning participation in the workforce by citizens and non-citizens across industries and for specific regions in the US. Specifically, it explored the following two questions:

a. What is the likelihood for a non-citizen to be employed in a given industry, when factors including sex, age, education, English proficiency, years in the US, and place of birth are held constant? How do these trends compare across industries?
b. How different is this trend across the nine different regions within the United States?

This part of the report followed a general methodology of treating employment status as the dependent variable, and likelihood of employment was predicted controlling for independent factor variables like citizenship status, age, sex, educational attainment, and English proficiency. This methodology was a little different for the section called "The Income (Wage) Effect." The objective of that section was to predict the likelihood of earning higher wages and this likelihood was projected based on other factor variables like citizenship and educational attainment.

As discussed above, our study focused on how skill sets were related to an individual's likelihood of being employed and how this differed for non-citizens, compared to citizens. The literature did not reveal any clear consensus among experts regarding the best predictors of a worker's skills. In our model for predicting employment we included variables which were repeatedly noted as important, such as the ability to speak English and educational attainment.

DATA AND METHODOLOGY

PREDICTORS

Region: The US Census Bureau divides the US into 4 basic regional classifications, with a total of 9 divisions or geographic regions. These 9 divisions are: New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific Division. Figure 8 below is a pictorial representation of this classification (United States Census Bureau, *n.d.*).
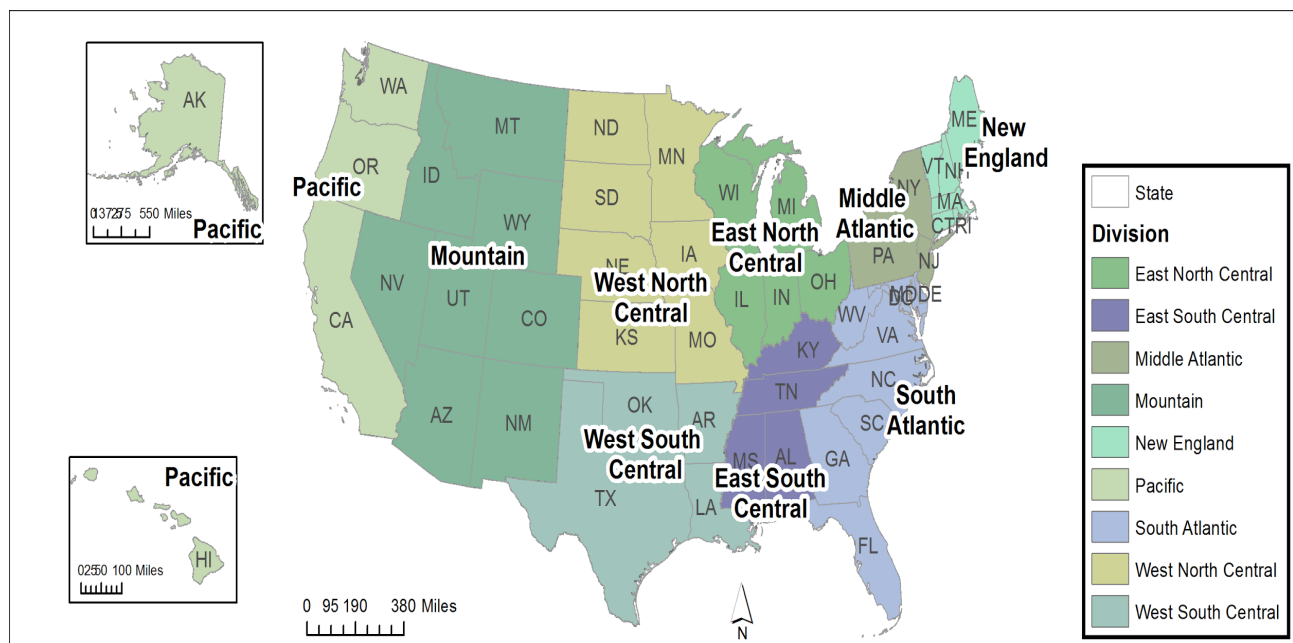
Figure 8
Source: US Census Bureau

Country of Origin: Of interest to our research was the correlation between a person's country of origin and their participation in the workforce. For the purpose of this analysis, the sample was divided into seven classifications of the place of birth:

- US Born,
- Born in North America,
- Born in Latin America,
- Born in Europe,
- Born in Asia,
- Born in Africa and
- Born in Oceania.

This classification is based international regional classifications as followed by the United Nations (UN DESA, 2015).

Industry: A person's citizenship status was highly statistically insignificant in determining the likelihood of employment in the Military as an industry. For this reason people working in the Military had not been included in the following analysis.[1] Therefore, the total number of industries reduced to 13 from 14, the rest of the classification remained the same as in the previous part:

- Agriculture, Forestry, Fishing and Hunting, and Mining
- Construction
- Manufacturing

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[1] A logit regression for employment likelihood of workers in the Military had a statistically insignificant relationship with citizenship since the p-values were very high, ranging from P>0.942 to P>0.397 for the years 2015, 2010 and 2005. This could be owing to the fact that for all the 3 years, the non-citizen military population had a frequency of only 83, 90 and 73 for 2015, 2010 and 2005, respectively

- Wholesale Trade
- Retail Trade
- Transportation, Warehousing, and Utilities
- Information and Communications
- Finance, Insurance, Real Estate, and Rental and Leasing
- Professional, Scientific, Management, Administrative, and Waste Management Services
- Educational, Health and Social Services
- Arts, Entertainment, Recreation, Accommodation and Food Services
- Public Administration
- Other Services (Except Public Administration)

The other predictor variables considered are:
- the number of years a person has spent in the US;
- ability to speak English; and
- educational qualifications.

As per the literature discussed above, these variables were correlated with a person's employability and likelihood of being employed. One relevant sweeping qualification in this analysis was that it included the population who are of or above the age of 16 years, and even labor force participants who are over 65 years of age.

MODELS USED

This section of the paper relied on two different, but very similar, tools of statistical analysis to examine the relationships between one's citizenship status and employment status.

In the first, it determined the basic relationship between our focal dependent variable, employment status and independent variable, citizenship status, and then studied the variation through other predictor variables. We first ran a basic OLS regression of the focal dependent and independent variables: employment status and citizenship status and subsequently introduced the predictor variables – educational attainment, ability to speak English, and place of birth – one after the other. After this basic OLS estimation, we used these variables and other variables that emerged as significant, in the Logit model of analysis to predict the likelihood of employment. The final section analyzed how the likelihood of employment trends for citizen and non-citizen workers differed across the nine different regions.

FINDINGS

ORDINARY LEAST SQUARE MODEL

Tables 1 and 2 below show the correlation between citizenship status and the likelihood of employment with additional control variables. Table 1, which indicates the bivariate model of the relationship between employment and citizenship, shows that for all the 4 years (2000, 2005, 2010, 2015) in our analysis, citizens had a slightly greater likelihood to be employed compared to non-citizens, when no other variables had been controlled. Specifically, compared to non-citizens, citizens were 0.04 percentage points more likely to be employed in 2015, 0.94 percentage points

more likely to be employed in 2010, 0.71 percentage points more likely to be employed in 2005, and 1.94 percentage points more likely to be employed in 2000.[2] Table 1 therefore indicated that not taking into consideration worker characteristics, citizens were more likely to be employed than non-citizens. However, in Table 2 where other worker attributes like educational attainment, proficiency in speaking English and place of birth were considered in the model determining the likelihood to be employed, non-citizens became more likely to be employed.

Table 1: Bivariate Ordinary Least Squares Model

	2015	2010	2005	2000
Citizenship	0.00035*	0.00947	0.00705	0.01938
	-0.00068	-0.0009	-0.00079	-0.00034
N	1503072	1498536	1409552	6724390

Marginal effects; Standard errors in parentheses
*This is a statistically insignificant result since p>0.05.

The level of educational attainment significantly changed the influence that citizenship status had on the likelihood of employment. Table 2 indicates that for 2015 and 2010, when education was included as a factor in determining the likelihood of employment, citizens were less likely than non-citizens to be employed, in contrast with the results presented in Table 1.

As expected, an increase in the level of education increased the likelihood of employment for workers in the labor force. Even though education by itself increased the likelihood of employment, as stated above, it reduced a citizen's likelihood of employment by 0.68 percentage points in 2015, and 0.50 percentage points in 2010. The relationship for 2005 was statistically insignificant. Interesting finding here was the in 2000, when levels of education were adjusted for in the model, citizens were 1.36 percentage points more likely to be employed than non-citizens.

Table 2: Multivariate Ordinary Least Squares Model

	2015	2010	2005	2000
Citizenship	-0.00684	-0.00497	0.00065	0.01356
	(0.00075)	(0.00094)	(0.00083)*	(0.00036)
Education	0.02262	0.03848	0.02707	0.02563
	(0.00016)	(0.00021)	(0.00018)	(0.00008)
N	1520999	1518881	1421204	6777206

Marginal effects; Standard errors in parentheses
* indicates statistically insignificant results since P>0.05

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[2] This value for 2015 is not statistically significant owing to a high p-value. However, the coefficient for citizenship for 2015 becomes highly significant (p = 0.000) in all subsequent cases, with the addition of the predictor variables.

Table 3 indicates the likelihood of employment of workers from the entire workforce born outside the US, depending on their place of birth. The findings in this analysis corroborated with the finding that when educational attainment and the proficiency in English were considered, in most of the cases people born in the US were less likely to be employed than those born outside. The only exception here was that workers born in Africa were less likely than their US born counterparts to be employed. In 2015, they were less likely by 1.69 percentage points than US born workers to be employed, in 2010, they were less likely by 2.40 percentage points, 1.78 and 1.58 percentage points in 2005 and 2000 respectively.

Table 3: Multivariate Ordinary Least Squares Model

	2015	2010	2005	2000
Education	0.02323	0.03924	0.02744	0.02552
	(0.00017)	(0.00022)	(0.00018)	(0.00008)
Speaking English	-0.00163	-0.00087	-0.00242	-0.00314
	(0.00033)	(0.00042)	(0.00036)	(0.00015)
Born in the US	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)
Born in North America	0.01082	0.00754	0.01219	0.01113
	(0.00306)	(0.00400)*	(0.00330)	(0.00148)
Born in Latin America	0.02113	0.02107	0.01084	-0.00708
	(0.00083)	(0.00107)	(0.00093)	(0.00041)
Born in Europe	0.00583	0.00317	0.00467	0.00808
	(0.00131)	(0.00168)*	(0.00144)	(0.00063)
Born in Asia	0.00300	0.00227	-0.00331	0.00135
	(0.00097)	(0.00129)*	(0.00117)	(0.00053)
Born in Africa	-0.01687	-0.02401	-0.01781	-0.01584
	(0.00231)	(0.00320)	(0.00306)	(0.00149)
Born in Oceania	0.00263	-0.00352	0.00810	0.00477
	(0.00585)*	(0.00786)*	(0.00723)*	(0.00317)*
N	1520999	1518881	1421204	6777206

Marginal effects; Standard errors in parentheses
*indicates statistically insignificant results since P>0.05

LOW SKILL, MIDDLE SKILL & HIGH SKILL WORKERS EMPLOYMENT LIKELIHOOD

As discussed earlier, different studies used different indicators of skills. Hall, Singer, Jong & Graefe (2011) classified skills based on a person's educational qualifications. A person without a high school diploma was considered to be low skilled, those with a high school diploma or equivalent were considered middle skilled and those with any college or associate degree or above

were considered high skilled. We used this definition in our analysis of a non-citizen's likelihood of employment, while controlling for other predictor variables like age, the number of years a person has spent in the US, and their proficiency in speaking English.

RELATIONSHIP WITH YEARS STAYED IN THE US

Table 4 compares the likelihood of the employment of workers born outside the US, with those born in the US, given the specific skill level. As explained earlier, the classification of workers into low, middle and high skill is based on educational attainment.

Consistent with the findings on citizenship, even at given skill levels, workers born outside the US were generally more likely to be employed than those born in the US, with some exceptions. For this analysis workers were divided into six groups: Native-born US citizens, and among the workers who had moved to the US from another country they were divided into the following 5 groups: 0-5 years in the US, 6-10 years, 11-15 years, 16-20 years and more than 21 years.

Among the above classification low skilled workers from outside the US were always more likely to be employed compared to those born in the US. This likelihood increased from 1.57 percentage points for those who had lived in the US for 0-5 years, to 2.11 percentage points for those who had been in the US for 6-10 years. Subsequently even though the low skilled workers born outside the US were more likely to be employed than their native-born counterparts, the likelihood kept decreasing for workers who had stayed in the US for more than 10 years. Therefore, workers who had lived in the US for 11-15 years were 1.98 percentage points more likely to be employed than those born in the US; this likelihood dropped to 1.86 percentage points for the 16-20 years category and to 0.93 percentage points for the above 21 years category.

Among the middle skilled workers, the trend of likelihood of employment was very similar, where workers who had stayed in the US for lesser than 5 years were 0.51 percentage points more likely to be employed than workers born in the US, and those who had stayed in the US for over 21 years were only 0.01 percentage points more likely to be employed than workers born in the US.

Among the high skilled workers, the trend differed slightly. Workers who had stayed in the US for 5 years are in fact 0.33 percentage points less likely to be employed than workers born in the US. However, workers who had stayed in the US for 6-10 years and for 11-15 years were more likely to be employed than those born in the US by 0.03 and 0.06 percentage points respectively. However, workers who had stayed in the US for more than 15 years and are high skilled they were less likely to be employed compared to high skilled workers born in the US. Those who had stayed in the US for 16-20 years were 0.09 percentage points less likely to be employed and those who had stayed here for more than 21 years were 0.19 percentage points less likely to be employed compared to workers born in the US.

This trend of decreasing likelihood for longer years stayed in the US for workers born outside the US could be explained by the fact that the number of years in the US labor market were important when those years were small, however, for an experienced worker, those numbers didn't count for as much, while seeking employment. Also, it had been discussed in the literature that people who had stayed in a US for a long time, such as naturalized citizens, tend to have a similar industry and

occupational distribution with native born citizens, which decreased their employment possibility compared to non-citizens. Consequently, more years of US experience did not necessary increase the possibility of employment for a worker born outside the US. Our results also corroborated with the literature to the extent that, non-citizen workers were in fact overrepresented in the high skilled industries, like Educational, Health Services and Social Services, and Professional Services, when compared to the low skilled industries like Construction and Manufacturing.

Table 4: Years stayed in the US as a determinant of employability based on skill level

	Low skilled	Middle skilled	High skilled
Citizenship	-0.00920	-0.00410	-0.00119
	(0.00210)	(0.00122)	(0.00044)
Native-born US Citizen	0.00000	0.00000	0.00000
	(.)	(.)	(.)
0-5 years in the U.S	0.01566	0.00514	-0.00326
	(0.00311)	(0.00164)	(0.00078)
6-10 years in the U.S	0.02111	0.00708	0.00027
	(0.00261)	(0.00140)	(0.00060)
11-15 years in the U.S	0.01976	0.00831	0.00059
	(0.00245)	(0.00118)	(0.00052)
16-20 years in the U.S	0.01862	0.00884	-0.00090
	(0.00253)	(0.00116)	(0.00056)
21+ years in the U.S	0.00933	0.00012	-0.00185
	(0.00227)	(0.00108)	(0.00037)
N	134338	369512	999222

As the level of skill (educational attainment) increased, the lesser proficient the worker in English, the more likely he or she was to be employed. This indicated that even though it was important to know English, the level of English proficiency, especially in the high skilled sector did not make a worker more likely to be employed. Also, being proficient in English was more important for the lower and middle skill worker since speaking English increases their likelihood of employment. The lack in English proficiency reduced a low-skilled worker's likelihood of being employed, whereas in the high skilled industry, the more proficient worker was less likely to be employed.

Even though this section discussed the likelihood of employment for workers in the entire labor force, English proficiency was an issue predominantly for the non-citizen worker. This was inferred from the fact that among the citizen workers, a very small proportion (0.13%) had no knowledge of English.

Table 5: English proficiency as a determinant of employability based on skill level

	Low skilled	Middle skilled	High skilled
Citizenship	-0.00920	-0.00410	-0.00119
	(0.00210)	(0.00122)	(0.00044)
Does not speak English	0.00000	0.00000	0.00000
	(.)	(.)	(.)
Speaks only English	-0.01249	-0.00604	-0.00463
	(0.00264)	(0.00199)	(0.00087)
Speaks English very well	-0.00440	-0.00335	-0.00562
	(0.00254)	(0.00199)	(0.00087)
Speaks English well	0.00387	-0.00213	-0.00274
	(0.00237)	(0.00204)	(0.00090)
Speaks English but not well	0.00560	0.00116	-0.00104
	(0.00215)	(0.00204)	(0.00094)
N	134338	369512	999222

Workers who do not speak English were more likely to be employed compared to those who only speak English, and who speak English very well for all, low, middle and high skilled workers. For the low skilled workers who speak only English, they were 1.25 percentage points less likely to be employed compared to their low skilled counterparts who do not speak English at all. Middle skilled and high skilled workers who only speak English were also 0.60 percentage points and 0.46 percentage points less likely to be employed compared to their counterparts with the same level proficiency in English. However, low and middle skilled workers who speak English but not well were 0.56 percentage points and 0.12 percentage points more likely of being employed compared to non-English speaking low and middle workers respectively. This result therefore in totality corroborated with the finding that non-citizens had higher likelihood of being employed since unsurprisingly, only 0.12% of citizens do not speak English.

Though citizens were generally less likely to be employed compared to non-citizens, they tend to earn higher wages. In this study, income referred to income earned from wages or a person's own business or farm in the previous year (Integrated Public Use Microdata Series, *n.d.*).

Table 6 indicates that citizens were 36.94 percentage points more likely to earn higher wages compared to non-citizens. As expected middle and high skilled workers were exponentially more likely to earn higher wages. As indicated in Table 3 in the appendix, Latin American workers were 2.11 percentage points more likely than US born workers to be employed; however our analysis shows that they were 17.09 percentage points less likely to earn higher wages in comparison to the same group.

Table 6: Likelihood of earning Higher Income, 2015

	(1)	(2)	(3)
Citizenship	0.36940	0.13789	
	(0.00419)	(0.00414)	
Low Skill		0.00000	0.00000
		(.)	(.)
Middle Skill		0.29061	0.28358
		(0.00406)	(0.00408)
High Skill		0.96128	0.93907
		(0.00373)	(0.00378)
Born in the US			0.00000
			(.)
Born in North America (no USA)			0.45246
			(0.01640)
Born in Latin America			-0.17085
			(0.00406)
Born in Europe			0.30964
			(0.00690)
Born in Asia			0.25672
			(0.00475)
Born in Africa			-0.07976
			(0.01233)
Born in Oceania			0.27256
			(0.03136)
N	1503072	1503072	1503072

Our research revealed that when adding predictor variables like educational attainment, English speaking proficiency, and years stayed in the United States, the statistical significance to citizenship in determining the likelihood of employment increased. For Construction and Manufacturing industries, in years 2015, 2010 and 2005, citizen workers were less likely to be employed compared to the non-citizen workers. For Professional Services industry, citizens were also 0.4 percentage points and 1.0 percentage points less likely to be employed in the years 2015 and 2010. The following analysis established the correlation of how indicator variables influence employability of citizens and non-citizens in specific industries. For almost all of the industries in our analysis, our data showed that for workers in general, the more years one had stayed in the US, the lesser was the likelihood of employment, which corresponded to the result noted above that citizens were less likely to be employed. In terms of education attainment, in low skill industries like Construction and Manufacturing, workers in the entire labor force, with low English proficiency and low educational attainment were more likely to be employed, which concurred with the literature review. In terms of language proficiency, while the ability of speaking in English was necessary, the fluency in English did not increase the likelihood of employment.

In Agriculture, Forestry, Fishing, Hunting and Mining industry, for year 2010 and 2015, workers in the entire labor force, from Central America, Asia and Europe were more likely to be hired compared to those from the Oceania regions. In 2010 and 2005, workers without a high school degree were 2.8 and 2.9 percentage points, respectively, less likely to be employed compared to those with a master's degree or more. When it came to years stayed in the US, it showed that generally, the lesser the number of years that workers had stayed in the US, the more likely they were to be employed. In 2015, compared to those who had stayed in the US for more than 20 years, workers who had stayed in the US for less than 5 years and who had stayed for more than 10 years were 4.2 percentage points and 1.7 percentage points more likely to employed.

In the Construction industry, citizenship had a significant relationship with employment in the year 2010 and 2015. In 2015, citizen workers were 1.5 percentage points less likely to be employed than non-citizen workers and 1.9 percentage points in 2010. Therefore, comparatively, non-citizen workers were more likely to be employed in this industry. In terms of years stayed in the US, the data showed that an increase in the number of years stayed in the US decreased the likelihood of workers to be employed in 2005 and 2010. However, in 2015, when it came to English proficiency, those who only speak English or speak English very well were less likely to be employed compared to those can speak English but not very well. This trend was similar for all three preceding years.

The Manufacturing industry presented a similar trend as the Construction industry. Citizen workers were on average 0.53 percentage points less likely to be employed. In terms of language proficiency, those who speak English well and only speak English were less likely to be employed compared to those with lower language proficiency. For education level, workers who had some college degree or less were on average 1.5 percentage points more likely to be employed. This percentage was even higher in 2010 and 2000.

In the Wholesales Trade industry, for all the four years, compared to workers with a master's degree or more, people with lower educational attainment were more likely to be employed. In the

Retail Trade industry, in terms of educational attainment, in 2015, workers with high school diploma and college degree were 0.24 and 0.30 percentage points more likely to be employed compared to those who earned a master's degree.

In the Transportation, Warehousing and Utility industry, workers with bachelor's degree or associate degree were more likely to be employed compared to those who had a master's degree or higher. With respect to English proficiency, those who speak English very well and only speak English were less likely to be employed than those who speak English but not well, which implied that non-citizens may have an advantage in terms of employment possibility in this industry. The trend was similar for the correlation between English proficiency and employment status. Regarding educational attainment, those with a master's degree were more likely to be employed compared to lower educational attainment, which implied that this industry had a high requirement for educational qualification.

EMPLOYMENT LIKELIHOOD ACROSS REGIONS IN THE US

In this section we explore, firstly, the non-citizen concentration in Metropolitan Areas across the US, and then follow it up with the likelihood analysis in the nine divisions of the US Census Bureau. Figure 9 presents general non-citizen concentration in Metropolitan Areas across the United States. Figures 10 & 11 show industry specific concentration of non-citizen workers. As mentioned earlier, the United States Census Bureau divides the US into 9 divisions:

- Pacific
- Mountain
- West North Central
- West South Central
- East North Central
- East South Central
- Middle Atlantic
- South Atlantic
- New England

The proportion of non-citizens in the workforce has almost remained constant since 2000 (Table 7). Out of the total labor force in the United States, non-citizens comprised 6.88% of the labor force in 2015, 7.20% in 2010, 6.62% in 2005 and 6.63% in 2000.

Table 7: Non-citizen participation in the US workforce

Year	Percentage
2015	6.88%
2010	7.20%
2005	6.62%
2000	6.63%

Eleven Metropolitan Areas had 12.47% to 21.65% of non-citizen workers in the US, which was the highest of any Metropolitan Area. Of these, four Metropolitan Areas: Yakima, WA; Napa, CA; Fresno CA; and Bakersfield CA, fell within the Pacific division. Yuma, AZ was the only one that fell in the Mountain Division; and four of these fell in the West South Central Division. It was interesting to note that along the Texas border, Metropolitan Areas mostly had either the highest concentration of non-citizen workers or had a non-citizen population ranging from 0% to 0.32%. Therefore, the non-citizen population was not spread across, but concentrated only in a few metropolitan areas. In Florida however, this trend differed and there was a more even distribution of non-citizen workers across the entire state, with Miami-Fort Lauderdale having the highest proportion of non-citizen workers in the 12.47% to 21.65% range.

U.S. Non-citizen Population by Metropolitan Area (MSA), 2011-2015 (pooled)
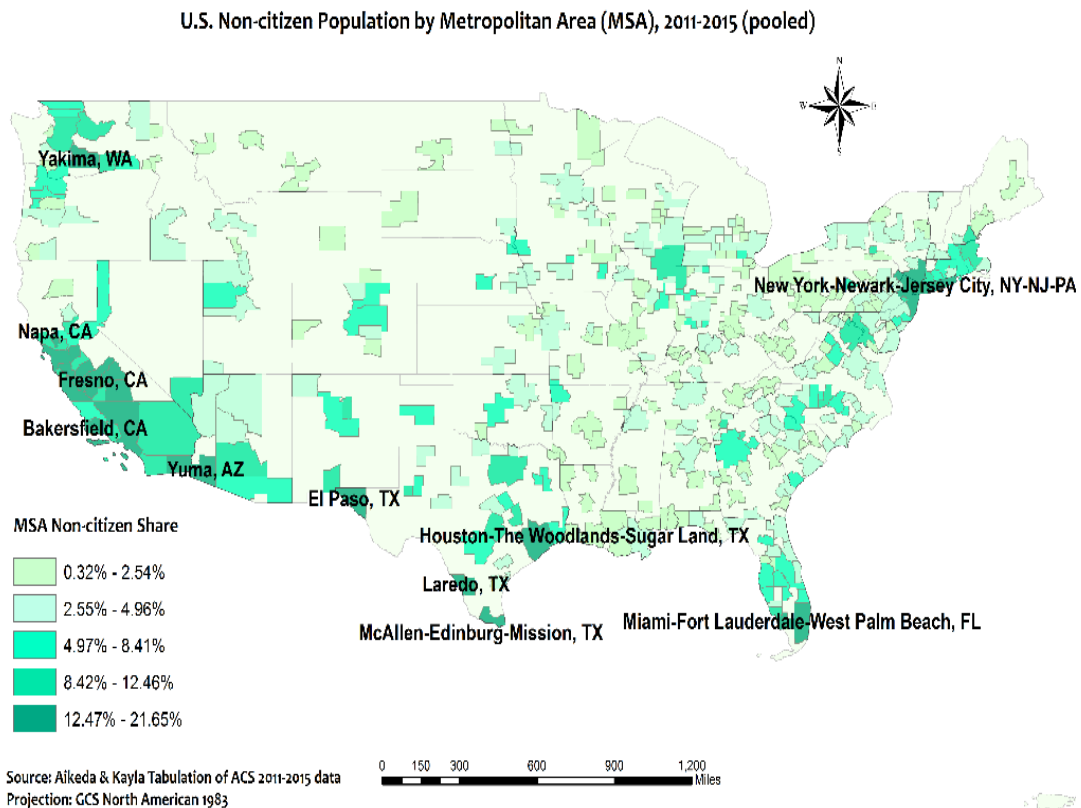
Figure 9

Figure 10 shows two maps. The first one displays non-citizen worker concentration in the Agriculture, Forestry, Fishing and Hunting, and Mining industry. In this sector, the **top 7 out 10 Metropolitan Areas with the highest percentage of non-citizen workers were in the Pacific Division**, **The New England and Mid-Atlantic Regions did have a concentration of non-citizen workers in this sector**.

The latter map displays non-citizen concentration in the Arts, Entertainment, Accommodation and Food Service industry. In this sector, non-citizen workers were concentrated more in the Mountain division; **5 out of the top 10 Metropolitan Areas with the highest proportion of non-citizen workers from this industry were in the Mountain division.**

<div align="center">

Figure 10

</div>

Top 10 MSAs with highest % of Non-citizen workers in Agriculture, Forestry, Fishing and Hunting, and Mining Industry	
Metropolitan Area	% of Non-citizen workers in Agriculture, Forestry, Fishing and Hunting, and Mining Industry
Madera, CA	61.50%
Visalia-Porterville, CA	53.10%
Yakima, WA	50.70%
Hanford-Corcoran, CA	49.10%
Wenatchee, WA	45.50%
Bakersfield, CA	43.10%
Salinas, CA	42.60%
Sebring, FL	41.30%
Kennewick-Richland, WA	39.40%
Fresno, CA	38.50%
Calculation: Number of Non-citizen workers in Agriculture, Forestry, Fishing and Hunting, and Mining Industry/Total number of Non-citizen Workers (by MSA)	

Top 10 MSAs with highest % of Non-citizen workers in Arts, Entertainment, Accommodation and Food Service Industry	
Metropolitan Area	% of Non-citizen workers in Arts, Entertainment, Accommodation and Food Service Industry
Flagstaff, AZ	45.70%
Lake Havasu City-Kingman, AZ	43.10%
Atlantic City-Hammonton, NJ	43.10%
Las Vegas-Henderson-Paradise, NV	39.10%
Norwich-New London, CT	36.20%
Pittsfield, MA	35.60%
Kahului-Wailuku-Lahaina, HI	35.60%
St. George, UT	34.80%
Prescott, AZ	33.10%
Bend-Redmond, OR	32.40%
Calculation: Number of Non-citizen workers in Arts, Entertainment, Accommodation and Food Service Industry/Total number of Non-citizen Workers (by MSA)	

Source: Aikeda & Kayla Tabulation of ACS 2011-2015 data
Projection: GCS North American 1983

The first map in Figure 11 shows the geographical concentration, by MSA, of non-citizen workers in the Educational, Health and Social Services industry. The Educational Services, and Health and Social Services industry employed the highest proportion of non-citizen workers. Most of the top 10 Metropolitan Areas in this classification were college towns and therefore, we expected that they would have a high proportion of non-citizen workers in the Education and Health Care industry.

The second map displays this concentration in the Professional, Scientific and Management industry which employed the second highest proportion of non-citizen workers among all the industries within the US.

Figure 11

2015 Non-citizen Workers in Education and Health Care Industry by MSA

% of Non-citizen Workers in Education Industry by MSA
- No Data
- 0.1% - 10.2%
- 10.3% - 14.3%
- 14.4% - 20.8%
- 20.9% - 69.9%

Top 10 MSAs with highest % of Non-citizen workers in Education and Health Care Industry	
Metropolitan Area	% of Noncitizen workers in Education Health Care Industry
Ithaca, NY	69.9
State College, PA	64.5
Ames, IA	61.1
Blacksburg-Christiansburg-Radford, VA	60.8
Columbia, MO	60.2
Champaign-Urbana, IL	56.4
Bloomington, IN	53.2
Lawrence, KS	51.0
Ann Arbor, MI	49.0
Corvallis, OR	46.9
Calculation: Number of Non-citizen workers in Education and Health Care Industry/Total number of Non-citizen Workers (by MSA)	

2015 Non-citizen Workers in Professional, Scientific and Management Industry by MSA

% of Non-citizen Workers in Professional Industry by MSA
- No Data
- 0.1% - 8.1%
- 8.2% - 11%
- 11.1% - 14.3%
- 14.4% - 27.8%

Top 10 MSAs with highest % of Non-citizen workers in Professional, scientific, and management Industry	
Metropolitan Area	% of Noncitizen workers in Professional Scientific, and Management Industry
Panama City, FL	27.8
San Jose-Sunnyvale-Santa Clara, CA	25.4
Seattle-Tacoma-Bellevue, WA	23.4
Bloomington, IL	22.5
Boulder, CO	22.3
Harrisburg-Carlisle, PA	21.8
San Francisco-Oakland-Hayward, CA	20.7
Trenton, NJ	19.7
Bridgeport-Stamford-Norwalk, CT	19.0
Racine, WI	18.9
Calculation: Number of Non-citizen workers in Professional, Scientific, and Management Industry/Total number of Non-citizen Workers (by MSA)	

Source: Aikeda & Kayla Tabulation of ACS 2011-2015 data
Projection: GCS North American 1983

Table 8 presents the recurring differences across the nine divisions in the United States by using the ACS 2015 data. Citizen workers were less likely to be employed in 7 out of 9 divisions, when

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compared to their non-citizen counterparts, and controlling for sex, age, place of birth, years stayed in the US, English speaking proficiency, and educational attainment. Citizen workers were less likely to be employed in the Middle Atlantic Division by 0.33 percentage points, in the East North Central Division by 0.30 percentage points, and the West South Central Division by 0.53 percentage points, compared to their non-citizen counterparts. Throughout, the differences of the employment likelihoods of citizens and non-citizens were very small. Meanwhile, citizens were 0.53 percentage points more likely to be employed in the East South Central Division compared to their non-citizen counterparts. For the other five divisions this relationship between probability of employment and citizenship was found to be statistically insignificant based on the sample used in this study.

In the New England Division, the East North Central Division, the West North Central Division, the South Atlantic Division and the East South Central Division, workers who were born in Latin America and the Caribbean were 0.66 percentage points more likely to be hired compared to their US born counterparts. In the New England Division and the East South Central Division, workers who were born in Asia and Africa also had a slightly higher likelihood to be employed. Apart from the New England Division and the Middle Atlantic Division, compared to workers who do not speak English, workers with proficient English speaking ability had a slightly lower likelihood of employment.

Table 8: Regional Trends across the US

	New England Division	Middle Atlantic Division	East North Central Division	West North Central Division	South Atlantic Division	East South Central Division	West South Central Division	Mountain Division	Pacific Division
Citizenship	(0.00052)	(0.00327)	(0.00296)	0.002843	(0.00058)	0.00194	(0.00532)	(0.00220)	(0.00084)
	0.00173	0.00103	0.001459	0.002873	0.000649	(0.00315)	(0.00139)	(0.00185)	(0.00081)
Sex	0.00969	0.00911	0.008923	0.010587	0.004627	0.00600	0.00812	0.00906	0.00767
	0.00064	0.00041	0.000369	0.000602	0.000234	(0.00054)	(0.00047)	(0.00062)	(0.00038)
Age 16-24	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Age 25-34	(0.00422)	(0.00022)	(0.00205)	(0.00076)	(0.00044)	(0.00267)	0.00149	(0.00147)	(0.00061)
	0.00084	0.00060	0.000523	0.00094	0.000352	(0.00088)	(0.00078)	(0.00086)	(0.00050)
Age 35-44	(0.00464)	(0.00207)	(0.00384)	(0.0008)	(0.0008)	(0.00149)	0.00199	(0.00123)	(0.00309)
	0.00095	0.00069	0.000595	0.00101	0.000387	(0.00091)	(0.00083)	(0.00095)	(0.00060)
Age 45-54	(0.00586)	(0.00100)	(0.00181)	(0.00067)	(0.00051)	0.00141	0.00324	(0.00227)	(0.00467)
	0.00091	0.00064	0.00054	0.000968	0.000372	(0.00084)	(0.00081)	(0.00096)	(0.00062)
Age 55-64	(0.00292)	0.00095	0.000932	0.00319	0.001248	0.00414	0.00538	(0.00203)	(0.00224)
	0.00084	0.00063	0.00051	0.000891	0.000361	(0.00081)	(0.00082)	(0.00098)	(0.00061)
Age >=65	0.00347	0.00824	0.00811	0.009666	0.006011	0.00900	0.01234	0.00585	0.00665
	0.00074	0.00060	0.000471	0.000856	0.00034	(0.00080)	(0.00080)	(0.00096)	(0.00056)
Born in USA	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
North America (no USA)	0.00485	(0.00711)	0.00089	0.010483	0.001964	0.00102	0.00243	(0.00763)	(0.00320)
	0.00272	0.00541	0.004564	0.003347	0.001965	(0.00946)	(0.00615)	(0.01099)	(0.00532)
Latin America & Caribbean	0.00461	(0.00083)	0.00558	0.011751	0.002797	0.00848	0.00622	0.00394	0.00580
	0.00192	0.00226	0.002141	0.002005	0.000924	(0.00275)	(0.00294)	(0.00545)	(0.00284)
Europe	0.00328	(0.00360)	0.004172	0.009867	0.000818	0.00463	0.00134	(0.00041)	(0.00265)
	0.00226	0.00274	0.002484	0.003145	0.001297	(0.00527)	(0.00434)	(0.00714)	(0.00425)
Asia	0.00502	0.00076	0.005253	0.008418	0.002519	0.00485	0.00239	0.00092	0.00230
	0.00195	0.00211	0.002185	0.003861	0.00101	(0.00505)	(0.00376)	(0.00653)	(0.00336)
Africa	0.00823	(0.00049)	0.001097	0.009406	-0.00219	0.00093	(0.00351)	0.00135	(0.00046)
	0.00182	0.00285	0.003695	0.003489	0.00184	(0.00795)	(0.00562)	(0.00721)	(0.00451)
Oceania	| .	(0.02463)	0.011257	0.006653	0.00342	(0.01347)	(0.01416)	(0.01766)	0.00226

	0.01619	0.002186	0.00861	0.003698	(0.02744)	(0.01448)	(0.01831)	(0.00449)
0 Yrs in US	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
0-5 years in the U.S	(0.00140)	(0.00246)	-0.00216	-0.01635	-0.00174	(0.00652)	(0.00750)	(0.00169)	(0.00079)
	0.00311	0.00272	0.0039	0.015091	0.001454	(0.01145)	(0.00534)	(0.00752)	(0.00379)
6-10 years in the U.S	0.00005	(0.00032)	-0.00083	-0.01617	0.00113	0.00311	(0.00353)	0.00227	0.00265
	0.00295	0.00245	0.003682	0.01509	0.001161	(0.00601)	(0.00471)	(0.00617)	(0.00323)
11-15 years in the U.S	(0.00249)	0.00180	-0.00508	-0.01619	0.001423	(0.00604)	(0.00199)	0.00283	0.00255
	0.00330	0.00214	0.004435	0.015036	0.001093	(0.01123)	(0.00437)	(0.00585)	(0.00321)
16-20 years in the U.S	0.00003	(0.00019)	-0.00411	-0.01559	0.00012	(0.00621)	(0.00134)	0.00125	0.00281
	0.00285	0.00237	0.004182	0.014863	0.00125	(0.01125)	(0.00424)	(0.00636)	(0.00317)
21+ years in the U.S	(0.00486)	(0.00101)	-0.00896	-0.02266	-0.00324	(0.00567)	(0.00377)	(0.00006)	0.00030
	0.00302	0.00224	0.004788	0.01688	0.001456	(0.01044)	(0.00451)	(0.00658)	(0.00346)
Does not speak English	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Speaks only English	(0.00100)	(0.00915)	-0.00521	-0.00506	-0.00414	(0.00783)	(0.00516)	(0.00456)	(0.00377)
	0.00330	0.00099	0.001963	0.00387	0.000759	(0.00236)	(0.00151)	(0.00232)	(0.00117)
Speaks English very well	(0.00314)	(0.00867)	-0.0065	-0.0046	-0.00368	(0.00511)	(0.00408)	(0.00785)	(0.00162)
	0.00329	0.00107	0.002003	0.003908	0.000771	(0.00250)	(0.00149)	(0.00234)	(0.00112)
Speaks English well	(0.00030)	(0.00320)	-0.00207	-0.00466	-0.00072	(0.00057)	(0.00198)	(0.00596)	0.00034
	0.00336	0.00106	0.002028	0.004146	0.00077	(0.00243)	(0.00154)	(0.00255)	(0.00112)
Speaks English but not well	0.00332	(0.00306)	0.000281	-0.0034	0.00019	(0.00052)	0.00227	0.00113	0.00301
	0.00332	0.00109	0.002009	0.004294	0.00076	(0.00246)	(0.00146)	(0.00237)	(0.00107)
No high school diploma	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
High school diploma	0.00331	0.00157	0.004636	0.006466	0.001754	0.00475	0.00200	0.00509	0.00083
	0.00117	0.00066	0.000709	0.001274	0.00039	(0.00108)	(0.00079)	(0.00120)	(0.00061)
Some college	0.00328	0.00282	0.006778	0.009674	0.002548	0.00749	0.00503	0.00814	0.00251
	0.00116	0.00066	0.000702	0.001243	0.000386	(0.00108)	(0.00077)	(0.00117)	(0.00059)
Bachelor's	0.00387	(0.00087)	0.006533	0.009736	0.001429	0.00930	0.00257	0.00690	(0.00097)
	0.00125	0.00078	0.000794	0.001391	0.000449	(0.00120)	(0.00094)	(0.00134)	(0.00072)
Advanced	(0.00034)	(0.00326)	0.00244	0.006555	-0.0013	0.00569	0.00016	0.00378	(0.00502)
	0.00156	0.00103	0.001096	0.001842	0.000635	(0.00158)	(0.00135)	(0.00174)	(0.00103)
Income	0.02290	0.02644	0.027624	0.024115	0.022202	0.02866	0.02727	0.02945	0.02882
	0.00059	0.00039	0.000407	0.000478	0.000365	(0.00074)	(0.00041)	(0.00055)	(0.00038)
N						82547	170401	106119	242413

RECOMMENDATIONS

This paper has made an effort to summarize the overarching non-citizen related trends in the workforce in the US. However, there were several limitations, including time and resources, because of which other relevant avenues could not be explored. There are various directions that this research can subsequently take. Below we discuss some of these which may be relevant to enrich the existing body of work on 'Immigration Participation in the Workforce.'

SCOPE FOR FUTURE RESEARCH

The future research can focus on the following aspects:

- An important arena where a gap in the literature exists is standardizing the **determinants of skills and therefore, a study looking at what constitutes the most representative determinants** of worker skills is recommended.

- Study the **likelihood of employment of non-citizen workers based on demographic characteristics,** including factors such as age and sex. The present study looked at whether educational attainment would make a non-citizen worker more likely to be employed, compared to a citizen worker. However, subsequent studies can look at whether and how additional skills may impact the likelihood of employment, within the non-citizen population.

- Study naturalized citizens as a different group of immigrant, but citizen workers. Our analysis revealed that they have mixed characteristics of both US born and foreign born worker force. Therefore, any subsequent study on immigration participation in the work force should include them as a distinct group.

- This study was limited to industry wise analysis only; this analysis can be taken forward by adding occupation into the model.

- To examine the overall impact of immigration participation in the workforce, it could be interesting to look at it from the perspective of the self-employed.

- Research about over qualification of immigrant workers in different Metropolitan Areas in the US may be interesting.

LIMITATIONS

One limitation of the data is that the present form of ACS was established only in 2005 and therefore, for the present study, the data sets for 2000 were coded accordingly to be consistent with the data from 2005 onwards. However, they were all obtained from IPUMS and therefore there is inherent homogeneity across the data sets. The other limitation of the research concerns the indicators of labor skill. Though we have added most of the relevant indicators analyzed by literature, it is still hard to cover all of the factors that might affect one's employment possibility. The other issue that is still vastly unsettled is what factors form a composite skill set related to an individual's employability.

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ADDITIONAL CHARTS

Figure A1

Education - Without High School Diploma

Figure A2

Education - Associate Degree

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Figure A3

Education - Bachelor's Degree

Figure A4

English Proficiency - Only Speaks English

Figure A5

English Proficiency - Speaks English Very Well

Figure A6

English Proficiency - Speaks English Well
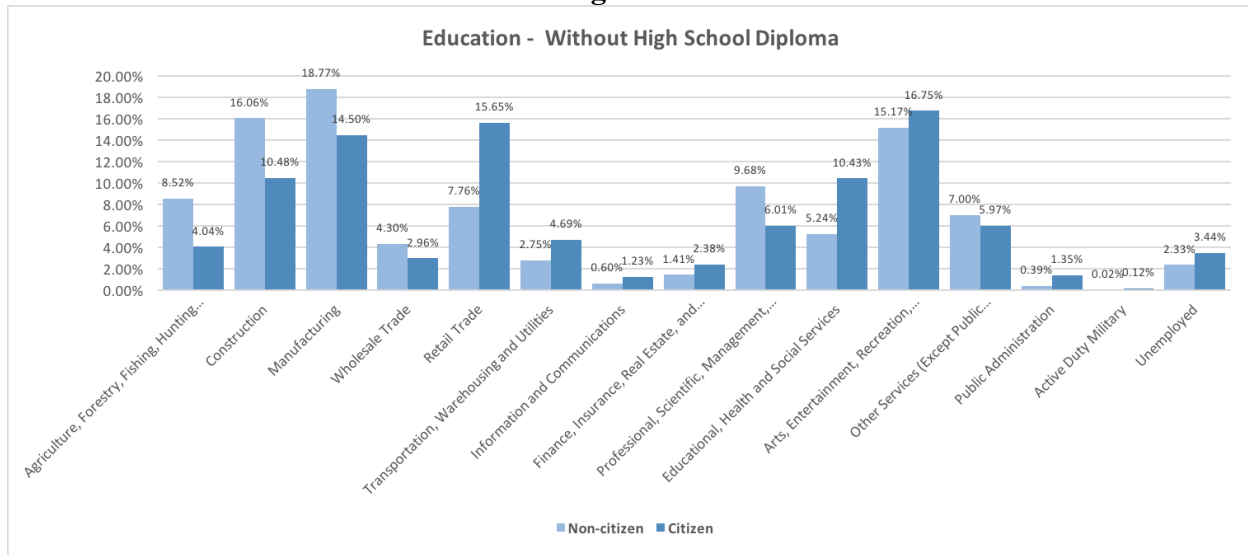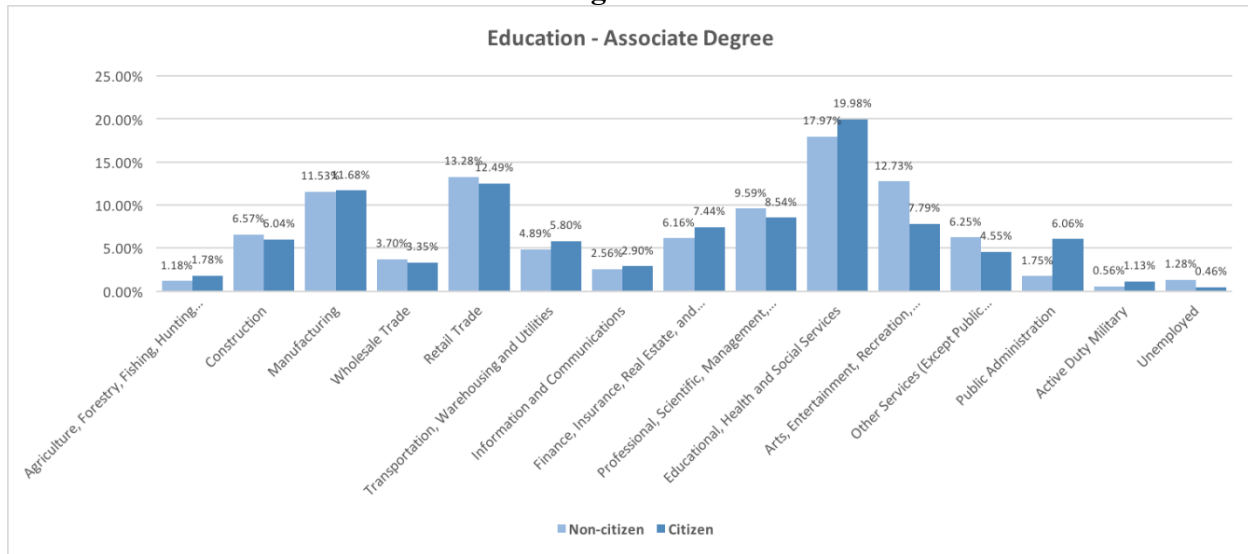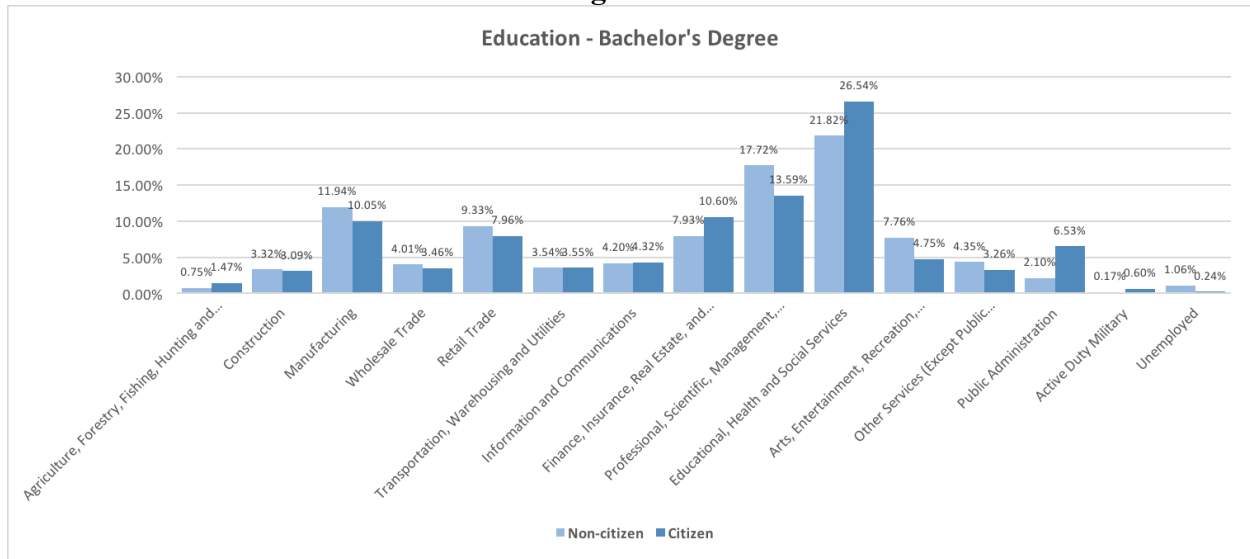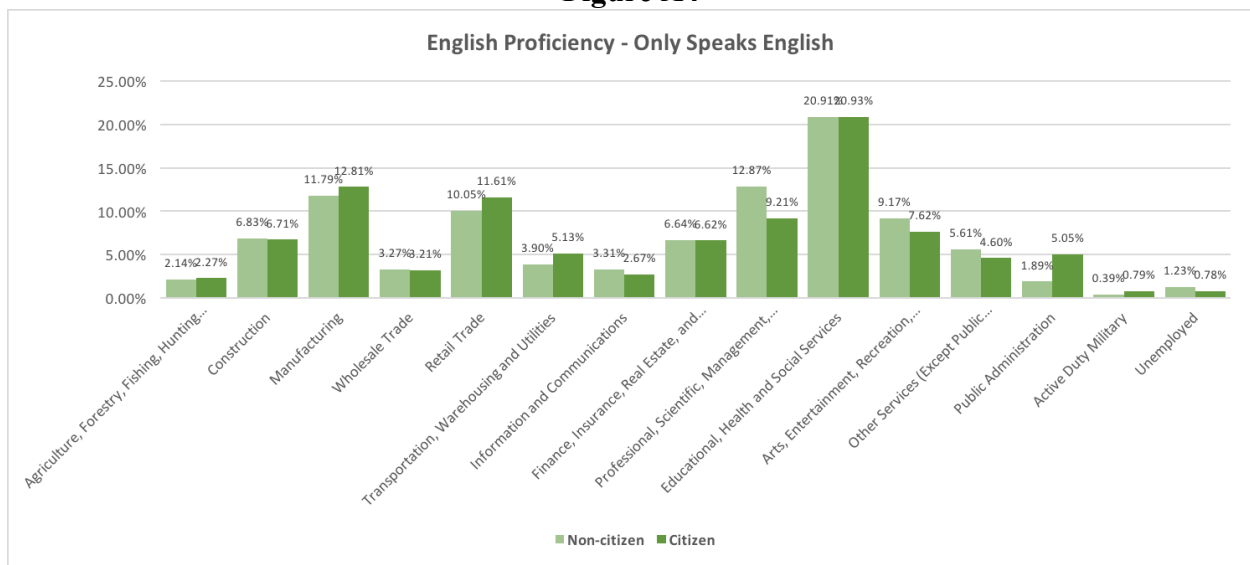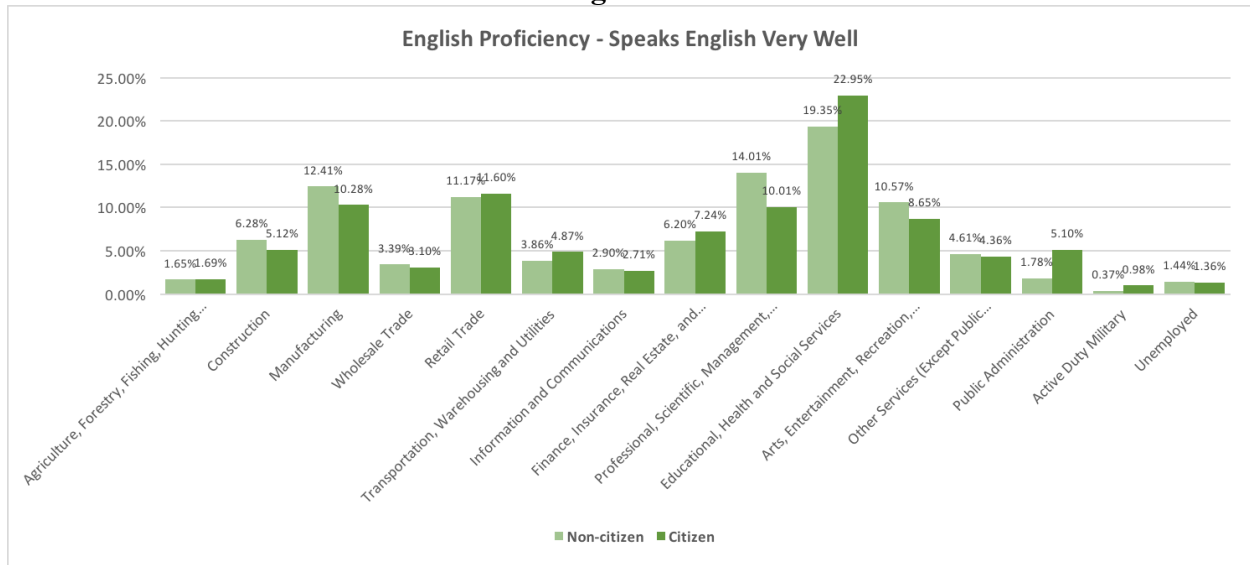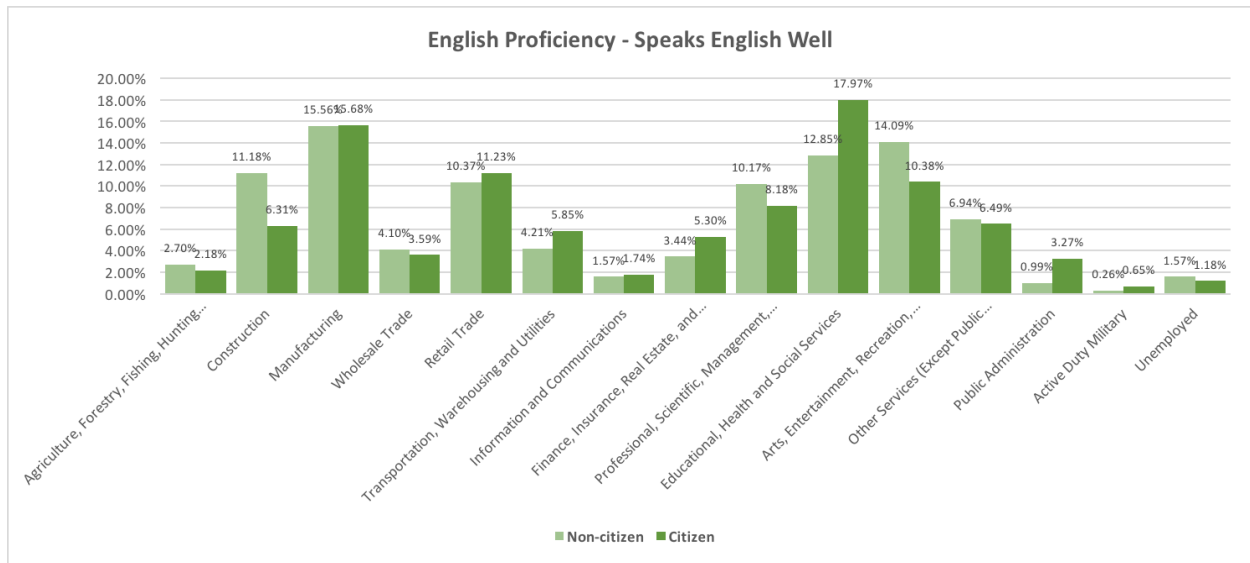
Table A1

Industry	Citizen	Industry	Non-Citizen
Educational Services, and Health Care and Social Assistance	339,485 (23.8)	Educational Services, and Health Care and Social Assistance	16,007 (15.21)
Retail Trade	157,606 (11.05)	Professional, Scientific, and Management, and Administrative, and Waste Management Services	14,880 (14.14)
Professional, Scientific, and Management, and Administrative, and Waste Management Services	155,306 (10.89)	Arts, Entertainment, and Recreation, and Accommodation and Food Services	13,983 (13.29)
Manufacturing	146,213 (10.25)	Manufacturing	11,954 (11.36)
Arts, Entertainment, and Recreation, and Accommodation and Food Services	122,155 (8.56)	Construction	11,860 (11.27)
Finance, Insurance, Real Estate, and Rental and Leasing	93,035 (6.52)	Retail Trade	9,276 (8.81)
Construction	80,662 (5.65)	Other Services, Except Public Administration	6,806 (6.47)
Transportation and Warehousing, and Utilities	71,094 (4.98)	Agriculture, Forestry, Fishing and Hunting, and Mining	4,559 (4.33)
Public Administration	69,690 (4.89)	Finance, Insurance, Real Estate, and Rental and Leasing	4,059 (3.86)
Other Services, Except Public Administration	66,048 (4.63)	Transportation and Warehousing, and Utilities	4,038 (3.84)
Wholesale Trade	38,110 (2.67)	Wholesale Trade	3,054 (2.9)
Information and Communication	30,460 (2.14)	Unemployed	1,795 (1.71)
Agriculture, Forestry, Fishing and Hunting, and Mining	29,838 (2.09)	Information and Communication	1,607 (1.53)
Unemployed	16,132 (1.13)	Public Administration	1,287 (1.22)
Military	10,707 (0.75)	Military	83 (0.08)
Total	**1,426,541 (100)**	**Total**	**105,248 (100)**

TABLE A2(a): Skill Differentials between citizens and non-citizens (absolute numbers: 2015)

Industry/ 2015 (Frequency Table)	Agri.	Const.	Manu.	Whole sale Tr.	Retail Trade	Transp. & Utilities	Info. Comm.	Finance	Prof. Ser.	Educ. & Health Service	Rec. & Food Service	Other Services	Public Admin.	Active Duty Military	Unem.
CITIZEN															
English Fluency															
Does not speak English	139	180	342	106	217	98	10	62	186	329	280	171	30	0	48
Only speak English	26373	70642	126681	32559	1E+05	60549	26799	80626	133704	291712	102316	55965	61245	9387	13034
Speak English very well	2,286	6641	11984	3754	16069	7038	2997	9972	16501	37291	13586	5989	6842	1101	2371
Speak English well	683	2254	4865	1172	4176	2558	504	1842	3612	7770	3860	2502	1228	191	467
Speak English, not well	357	945	2341	519	1545	851	150	533	1303	2383	2113	1421	345	28	212
Education Level															
No high school diploma	4,230	10537	12066	2538	14971	5348	885	2218	7875	11883	20001	6569	1428	68	5419
High school diploma	10935	32951	49847	10880	51636	25136	4494	15839	26191	51277	35049	19916	11909	3094	5184
Associate degree	8,819	26273	45733	12966	60867	26988	9742	30669	43574	105739	45306	22265	25844	4836	3901
Bachelor Degree	4,636	8950	27167	9363	24008	10605	11077	32335	47258	82943	17416	10626	19042	1626	1201
Master Degree or higher	1,218	1951	11400	2363	6124	3017	4262	11974	30408	87643	4383	6672	11467	1083	427

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TABLE A2(b): Skill Differentials between citizens and non-citizens (absolute numbers: 2015)

Industry/ 2015 (Frequency Table)	Agri.	Const.	Manu.	Whole sale Tr.	Retail Trade	Transp. & Utilities	Info. Comm.	Finance	Prof. Ser.	Educ. & Health Service	Rec. & Food Service	Other Services	Public Admin.	Active Duty Military	Unem.
NON-CITIZEN															
English Fluency															
Does not speak English	1,470	1767	1522	347	720	317	42	123	1272	768	1666	865	69	1	264
Only speak English	270	822	1287	352	1266	535	390	858	1970	3034	1295	727	255	24	163
Speak English very well	594	2148	3290	861	3285	1243	808	1938	5837	7000	3571	1491	563	39	521
Speak English well	728	3113	2630	705	2176	1055	258	728	2866	3357	3424	1597	248	15	407
Speak English, not well	1,497	4010	3225	789	1829	888	109	412	2935	1848	4027	2126	152	4	440
Education Level															
No high school diploma	3,248	6482	4598	1051	2398	1129	117	432	4020	2011	5483	2660	160	2	718
High school diploma	741	3396	2790	739	2599	1227	158	619	2450	2466	4096	1971	200	26	433
Associate degree	274	1322	1578	522	2363	867	299	836	1875	3581	2717	1179	289	29	332
Bachelor Degree	164	487	1401	459	1311	558	520	1126	3167	3340	1280	643	262	16	205
Master Degree or higher	132	173	1587	283	605	257	513	1046	3368	4609	407	353	376	10	107

TABLE A3: OLS Estimate of Naturalized Citizens' impact on Employment Likelihood

	2015		2010		2005		2000	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Citizen	-0.00553	-0.00607	-0.01041	-0.00932	-0.00534	-0.00779	0.00514	-0.00275
	(0.00089)	(0.00195)	(0.00119)	(0.00269)	(0.00110)	(0.00242)	(0.00049)	(0.00112)
Education	-0.00069	0.00047	-0.00199	-0.00044	0.00579	0.00677	0.01148	0.01197
	(0.00016)	(0.00017)	(0.00022)	(0.00023)	(0.00018)	(0.00019)	(0.00008)	(0.00008)
Speaking English	0.00207	0.00039	0.00386	0.00189	0.00014	-0.00128	-0.00159	-0.00252
	(0.00030)	(0.00034)	(0.00038)	(0.00043)	(0.00034)	(0.00037)	(0.00015)	(0.00016)
Income	0.03673	0.03694	0.07238	0.07260	0.03869	0.03875	0.02618	0.02643
	(0.00014)	(0.00015)	(0.00020)	(0.00021)	(0.00018)	(0.00019)	(0.00009)	(0.00009)
U.S Born	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Born in North America (no USA)	-0.00772	-0.01085	-0.01925	-0.02107	-0.00146	-0.00380	0.00754	0.00211
	(0.00275)	(0.00384)	(0.00369)	(0.00507)	(0.00312)	(0.00436)	(0.00141)	(0.00195)
Born in Latin America	0.01245	0.01760	0.01120	0.01686	0.00932	0.00997	0.00128	-0.00635
	(0.00088)	(0.00203)	(0.00121)	(0.00280)	(0.00111)	(0.00253)	(0.00050)	(0.00117)
Born in Europe	-0.00705	-0.01333	-0.01272	-0.01277	-0.00254	-0.00413	0.00671	0.00093
	(0.00119)	(0.00200)	(0.00158)	(0.00267)	(0.00140)	(0.00236)	(0.00062)	(0.00109)
Born in Asia	-0.00445	-0.00539	-0.00668	-0.00246	-0.00433	-0.00651	0.00506	0.00068
	(0.00091)	(0.00211)	(0.00124)	(0.00291)	(0.00116)	(0.00264)	(0.00054)	(0.00122)
Born in Africa	-0.00870	-0.01126	-0.01101	-0.00882	-0.00973	-0.01238	-0.00505	-0.00940
	(0.00209)	(0.00364)	(0.00299)	(0.00483)	(0.00292)	(0.00442)	(0.00143)	(0.00206)
Born in Oceania	-0.01063	-0.00946	-0.02630	-0.03067	-0.00319	-0.00891	0.00590	0.00028
	(0.00523)	(0.00673)	(0.00721)	(0.00910)	(0.00678)	(0.00819)	(0.00298)	(0.00368)
N	1503072	1386131	1498536	1393358	1409552	1328669	6724390	6391378

Table A4: Likelihood of employment for different skill levels (2015)

	Low skilled	Middle skilled	High skilled
citizen	-0.00920	-0.00410	-0.00119
	(0.00210)	(0.00122)	(0.00044)
sex	0.01414	0.01449	0.00613
	(0.00100)	(0.00042)	(0.00015)
Age 16-24	0.00000	0.00000	0.00000
	(.)	(.)	(.)
Age 25-34	-0.02731	-0.00180	-0.00022
	(0.00184)	(0.00073)	(0.00019)
Age 35-44	-0.01235	0.00154	-0.00239
	(0.00166)	(0.00075)	(0.00023)
Age 45-54	-0.00649	0.00553	-0.00336
	(0.00152)	(0.00068)	(0.00023)
Age 55-64	0.00502	0.00983	-0.00221
	(0.00147)	(0.00067)	(0.00023)
Age >=65	0.02315	0.02107	0.00344
	(0.00135)	(0.00064)	(0.00021)
0 years in the U.S	0.00000	0.00000	0.00000
	(.)	(.)	(.)
0-5 years in the U.S	0.01566	0.00514	-0.00326
	(0.00311)	(0.00164)	(0.00078)
6-10 years in the U.S	0.02111	0.00708	0.00027
	(0.00261)	(0.00140)	(0.00060)
11-15 years in the U.S	0.01976	0.00831	0.00059
	(0.00245)	(0.00118)	(0.00052)
16-20 years in the U.S	0.01862	0.00884	-0.00090
	(0.00253)	(0.00116)	(0.00056)
21+ years in the U.S	0.00933	0.00012	-0.00185
	(0.00227)	(0.00108)	(0.00037)
Does not speak English	0.00000	0.00000	0.00000
	(.)	(.)	(.)
Speaks only English	-0.01249	-0.00604	-0.00463
	(0.00264)	(0.00199)	(0.00087)
Speaks English very well	-0.00440	-0.00335	-0.00562
	(0.00254)	(0.00199)	(0.00087)
Speaks English well	0.00387	-0.00213	-0.00274
	(0.00237)	(0.00204)	(0.00090)
Speaks English but not well	0.00560	0.00116	-0.00104
	(0.00215)	(0.00204)	(0.00094)
N	134338	369512	999222

Table A5: Marginal Effects of worker characteristics and skills on the likelihood of employment (2015)

	Agri.	Const.	Manu.	Wholesale Tr.	Retail Trade	Transp. & Utilities	Info. Comm.	Finance	Prof. Ser.	Educ. & Health Services	Rec. & Food Services	Other Services	Public Administration
Citizenship													
newcitizen	-0.00691	-0.01498	-0.00312	0.00024	-0.00010	-0.00162	0.00553	0.00196	-0.00489	-0.00025	-0.00604	-0.00003	0.00044
	(0.00493)*	(0.00339)	(0.00106)	(0.0014)*	(0.00061)*	(0.00128)*	(0.00485)*	(0.00118)*	(0.00138)	(0.00011)	(0.00159)	(0.0008)*	(0.00053)*
Sex													
sex	-0.00083	0.02055	0.00423	0.00202	0.00163	0.00249	0.01205	0.00477	0.00776	0.00047	0.00515	0.00257	0.00112
	(0.00206)*	(0.00201)	(0.00041)	(0.00058)	(0.00018)	(0.00049)	(0.00148)*	(0.00042)	(0.00049)	(0.00005)	(0.00049)	(0.00031)	(0.00016)
Age													
16-24	-0.04723	-0.01382	-0.00423	-0.00761	-0.01049	-0.00627	-0.01044	-0.00525	-0.01538	-0.00097	-0.01873	-0.01130	-0.00187
	(0.00414)	(0.00311)	(0.00097)	(0.00137)	(0.00056)	(0.00101)	(0.00366)*	(0.00090)	(0.00115)	(0.00009)	(0.00165)	(0.00081)	(0.00034)
25-34	-0.04559	-0.01560	-0.00304	-0.00851	-0.01137	-0.00567	-0.01002	-0.00548	-0.01460	-0.00109	-0.01913	-0.01049	-0.00125
	(0.00400)	(0.00294)	(0.00093)	(0.00131)	(0.00059)	(0.00095)	(0.00355)*	(0.00082)	(0.00108)	(0.00009)	(0.00169)	(0.00081)	(0.00029)
35-44	-0.02990	-0.01971	-0.00359	-0.00825	-0.01035	-0.00448	-0.01999	-0.00793	-0.01686	-0.00125	-0.01910	-0.00998	-0.00131
	(0.00414)	(0.00294)	(0.00095)	(0.00133)	(0.00061)	(0.00096)	(0.00362)*	(0.00086)	(0.00112)	(0.00010)	(0.00176)	(0.00082)	(0.00031)
45-54	-0.02683	-0.02121	-0.00420	-0.00792	-0.00895	-0.00424	-0.02537	-0.00909	-0.01693	-0.00110	-0.01574	-0.00881	-0.00186
	(0.00406)	(0.00290)	(0.00093)	(0.00131)	(0.00060)	(0.00094)	(0.0036)*	(0.00085)	(0.00111)	(0.00010)	(0.00178)	(0.00080)	(0.00031)
55-64	-0.02117	-0.01793	-0.00428	-0.00669	-0.00670	-0.00441	-0.02572	-0.00726	-0.01369	-0.00085	-0.01258	-0.00724	-0.00148
	(0.00409)	(0.00296)	(0.00094)	(0.00131)	(0.00059)	(0.00094)	(0.00363)*	(0.00084)	(0.00112)	(0.00009)	(0.00185)	(0.00079)	(0.00030)
65+	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Birthplace													
USA	0.06245	0.00705	0.00099	-0.00468	-0.00469	-0.00541	0.01391	-0.00644	0.00578	0.00040	-0.00286	0.00192	0.00183
	(0.03138)*	(0.02357)*	(0.00674)*	(0.00994)*	(0.00315)*	(0.00821)*	(0.02882)*	(0.00718)*	(0.00765)*	(0.00055)*	(0.00921)*	(0.00409)*	(0.00196)*
North America	0.06563	0.00617	-0.00184	-0.01125	-0.00169	-0.00197	-0.02738	-0.00295	-0.00165	0.00122	-0.00993	0.00486	0.00150
	(0.03019)	(0.02472)*	(0.00717)*	(0.01033)*	(0.00347)*	(0.00933)*	(0.02591)*	(0.00739)*	(0.00791)*	(0.00061)	(0.0095)*	(0.00441)*	(0.00227)*
Central America	0.06691	0.01936	0.00441	-0.00490	-0.00049	-0.00261	-0.00167	-0.00146	0.00927	0.00083	0.00267	0.00537	0.00183
	(0.02285)	(0.02196)*	(0.00633)*	(0.00936)*	(0.00298)*	(0.00787)*	(0.02500)*	(0.00683)*	(0.00705)*	(0.00051)*	(0.00848)*	(0.00374)*	(0.00179)*
Europe	0.07534	-0.00017	0.00221	-0.01033	-0.00335	-0.00544	-0.01914	-0.00522	-0.00004	0.00081	-0.00487	0.00678	0.00244
	(0.02523)	(0.02224)*	(0.00644)*	(0.00952)*	(0.00303)*	(0.00796)*	(0.02504)*	(0.00687)*	(0.00713)*	(0.00052)*	(0.00863)*	(0.00388)	(0.00185)*
Asia	0.05662	-0.00692	0.00086	-0.00697	-0.00081	-0.00149	-0.00807	-0.00582	-0.00234	0.00098	-0.00093	0.00819	0.00264
	(0.02407)	(0.02231)*	(0.00635)*	(0.00939)*	(0.00299)*	(0.00791)*	(0.02498)*	(0.00683)*	(0.00706)*	(0.00051)	(0.00851)*	(0.00379)	(0.00182)*
Africa	0.03991	-0.01372	0.00230	-0.01009	-0.00177	-0.00044	-0.01902	-0.00935	-0.00223	0.00076	-0.00538	0.00083	0.00115
	(0.02956)*	(0.02454)*	(0.00679)*	(0.00983)*	(0.00315)*	(0.00805)*	(0.02592)*	(0.00707)*	(0.00742)*	(0.00053)*	(0.00900)*	(0.00395)*	(0.00191)*
Oceania	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Years in the US													
N/A	0.0071	0.0000	0.0025	-0.0006	0.0030	-0.0006	-0.0166	0.0045	-0.0007	0.0005	0.0013	0.0023	0.0005
	(0.02176)*	(0.00891)*	(0.00248)*	(0.00355)*	(0.00116)	(0.00257)*	(0.01492)*	(0.00245)	(0.00322)*	(0.00024)	(0.00388)*	(0.00178)*	(0.00088)*
0-5	0.0422	0.0094	-0.0004	0.0005	0.0001	-0.0032	-0.0003	0.0023	-0.0011	-0.0001	-0.0010	-0.0022	-0.0014
	(0.00690)	(0.00531)*	(0.00156)*	(0.00202)*	(0.00085)*	(0.00192)*	(0.00668)*	(0.00181)*	(0.00195)*	(0.00016)*	(0.00225)*	(0.00112)	(0.00070)*
6-10	0.0353	0.0096	0.0010	0.0012	0.0017	0.0006	0.0163	0.0069	0.0038	-0.0001	0.0019	0.0002	0.0016
	(0.00634)	(0.00452)	(0.00152)*	(0.00203)*	(0.00087)	(0.00181)*	(0.00825)*	(0.00209)	(0.00197)	(0.00016)*	(0.00216)*	(0.00113)*	(0.00087)
11-15	0.0172	0.0168	0.0034	0.0025	0.0016	0.0014	0.0086	0.0029	0.0036	0.0000	0.0016	-0.0002	0.0015
	(0.00525)	(0.00403)	(0.00139)	(0.00187)*	(0.00078)	(0.00169)*	(0.00672)*	(0.00154)	(0.00174)	(0.00015)*	(0.00195)*	(0.00096)*	(0.00074)
16-20	0.0121	0.0162	0.0022	0.0009	0.0010	0.0000	0.0081	0.0012	0.0050	0.0000	0.0019	0.0009	0.0001
	(0.00553)	(0.00416)	(0.00137)*	(0.00177)*	(0.00077)*	(0.00161)*	(0.00623)*	(0.00141)*	(0.00174)	(0.00015)*	(0.00201)*	(0.00104)*	(0.00067)*
20+	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
English proficiency													
Not speak English	-0.01199	0.00253	-0.00224	-0.00306	0.00021	-0.00003	0.02339	0.00321	0.00189	0.00011	0.00321	-0.00090	0.00038
	(0.00468)	(0.00489)*	(0.00170)*	(0.00225)*	(0.00149)*	(0.00284)*	(0.02464)*	(0.00418)*	(0.00264)*	(0.00030)*	(0.00301)*	(0.00130)*	(0.00126)*
Speak only English	0.00444	-0.01457	-0.00686	-0.00528	-0.00299	-0.00282	-0.02132	-0.00456	-0.01077	-0.00036	-0.00849	-0.00314	-0.00044
	(0.00538)*	(0.00372)	(0.00126)	(0.00174)	(0.00080)	(0.00161)	(0.00884)*	(0.00179)	(0.00174)	(0.00016)	(0.00179)	(0.00092)	(0.00064)*
Speak English very well	-0.00562	-0.01125	-0.00745	-0.00482	-0.00318	-0.00310	-0.02222	-0.00379	-0.00938	-0.00049	-0.00602	-0.00322	-0.00087
	(0.00521)*	(0.00362)	(0.00120)	(0.00167)*	(0.00080)	(0.00158)	(0.00881)*	(0.00176)	(0.00168)	(0.00015)	(0.00176)	(0.00089)	(0.00064)*
Speak English well	-0.00531	-0.00417	-0.00396	-0.00327	-0.00223	-0.00103	-0.01791	-0.00222	-0.00208	-0.00023	-0.00287	-0.00134	-0.00068
	(0.00518)*	(0.00368)*	(0.00125)	(0.00174)*	(0.00087)	(0.00167)*	(0.00954)*	(0.00192)*	(0.00183)*	(0.00017)*	(0.00192)*	(0.00094)*	(0.0007)*
Speak English not so well	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Education attainment													
Without high school diploma	-0.00192	-0.00331	0.01396	0.00226	0.00197	0.00428	-0.00346	0.00237	-0.00124	0.00031	-0.00333	-0.00084	0.00099
	(0.00622)*	(0.00487)*	(0.00112)	(0.00153)*	(0.00062)	(0.00138)*	(0.00393)*	(0.00107)*	(0.00106)*	(0.00009)	(0.00186)	(0.00074)*	(0.00035)
With High school diploma	-0.00147	0.00049	0.01652	0.00576	0.00235	0.00681	0.00298	0.00420	0.00259	0.00057	-0.00365	0.00076	0.00218
	(0.00604)*	(0.00476)*	(0.00107)	(0.00146)	(0.00059)	(0.00130)	(0.00283)*	(0.00078)	(0.00089)*	(0.00007)	(0.00182)	(0.00070)*	(0.00031)
Associate degree	0.00673	0.00590	0.01557	0.00551	0.00306	0.00683	0.00486	0.00476	0.00514	0.00067	-0.00028	0.00115	0.00233
	(0.00612)*	(0.00480)*	(0.00107)	(0.00145)	(0.00059)	(0.00130)	(0.00260)*	(0.00074)	(0.00087)	(0.00007)	(0.00182)*	(0.00070)*	(0.00030)
Bachelor degree	0.00925	0.01414	0.00949	0.00259	0.00216	0.00592	-0.00288	0.00289	0.00444	0.00036	-0.00130	0.00213	0.00190
	(0.00648)*	(0.00518)*	(0.00108)	(0.00147)*	(0.00062)	(0.00139)	(0.00257)*	(0.00074)	(0.00090)	(0.00007)	(0.00193)*	(0.00079)	(0.00029)
Master's +	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Income													
newincome	0.03352	0.05171	0.02181	0.01672	0.02722	0.01822	0.02752	0.01328	0.02822	0.00553	0.07680	0.02284	0.00499
	(0.00089)	(0.00068)	(0.00042)	(0.00078)	(0.00056)	(0.00060)	(0.00077)	(0.00040)	(0.00042)	(0.00016)	(0.00100)	(0.00073)	(0.00035)
N	34,397	92,522	158,167	41,164	166,882	75,132	32,067	97,094	170,186	355,492	136,138	72,854	70,977

Marginal effects; Standard errors in parentheses

(d)for discrete change of dummy variable from 0 to 1

*indicates staistically insignificant results since p>0.05

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Table A6: Marginal Effects of worker characteristics and skills on the likelihood of employment (2010)

	Agri.	Const.	Manu.	Wholesale Tr.	Retail Trade	Transp. & Utilities	Info. Comm.	Finance	Prof. Ser.	Educ. & Health Services	Rec. & Food Services	Other Services	Public Administration
Citizenship													
new citizen	-0.00423	-0.01895	-0.00595	-0.00375	-0.00098	0.00201	0.00273	-0.00146	-0.01026	-0.00017	-0.00422	0.00044	-0.00042
	(0.00492)*	(0.00607)	(0.00179)	(0.00267)	(0.00121)*	(0.00201)*	(0.00644)*	(0.00196)*	(0.00215)	(0.00021)*	(0.00272)*	(0.00133)*	(0.00047)*
Sex													
sex	-0.00323	0.04395	0.01217	0.00414	0.00604	0.00840	0.01857	0.00785	0.01329	0.00114	0.01102	0.00784	0.00058
	(0.00202)	(0.00353)	(0.00069)	(0.00102)	(0.00037)	(0.00081)	(0.00193)	(0.00065)	(0.00075)	(0.00008)	(0.00082)	(0.00054)	(0.00011)
Age													
16-24	-0.05658	-0.02573	-0.00048	-0.01547	-0.01741	-0.01274	-0.00236	-0.00546	-0.02544	-0.00225	-0.02963	-0.02325	-0.00163
	(0.00431)	(0.00629)	(0.00180)	(0.00249)	(0.00093)	(0.00172)	(0.00498)*	(0.00149)	(0.00184)	(0.00017)	(0.00260)	(0.00134)	(0.00024)
25-34	-0.04850	-0.04467	-0.00437	-0.01738	-0.02003	-0.01182	-0.01349	-0.01259	-0.02651	-0.00239	-0.02963	-0.02145	-0.00145
	(0.00426)	(0.00588)	(0.00168)	(0.00238)	(0.00098)	(0.00161)	(0.00478)	(0.00136)	(0.00174)	(0.00017)	(0.00268)	(0.00134)	(0.00022)
35-44	-0.04547	-0.05113	-0.00684	-0.02197	-0.01839	-0.01217	-0.02639	-0.01781	-0.02846	-0.00218	-0.02768	-0.01904	-0.00112
	(0.00426)	(0.00584)	(0.00167)	(0.00242)	(0.00102)	(0.00159)	(0.00484)	(0.00139)	(0.00177)	(0.00017)	(0.00278)	(0.00134)	(0.00023)
45-54	-0.04260	-0.05796	-0.01173	-0.02264	-0.01604	-0.01197	-0.03043	-0.01651	-0.02859	-0.00186	-0.02523	-0.01669	-0.00115
	(0.00411)	(0.00578)	(0.00163)	(0.00238)	(0.00100)	(0.00155)	(0.00481)	(0.00137)	(0.00176)	(0.00017)	(0.00280)	(0.00132)	(0.00022)
55-64	-0.03619	-0.05151	-0.01295	-0.02190	-0.01254	-0.01070	-0.02710	-0.01454	-0.02401	-0.00153	-0.01735	-0.01342	-0.00085
	(0.00427)	(0.00601)	(0.00167)	(0.00243)	(0.00102)	(0.00160)	(0.00493)	(0.00139)	(0.00180)	(0.00017)	(0.00296)	(0.00133)	(0.00022)
65+	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Birthplace													
USA	0.06293	0.04717	-0.00321	-0.00040	-0.01037	-0.03252	0.00020	0.01110	-0.00881	-0.00217	0.02101	0.00861	-0.00185
	(0.02916)	(0.03963)*	(0.0127)*	(0.01938)*	(0.00617)	(0.01612)*	(0.03064)*	(0.00861)*	(0.01336)*	(0.00137)*	(0.01241)*	(0.00854)*	(0.00258)*
North America	0.15498	0.04388	-0.00901	-0.02327	-0.00741	-0.03208	0.02518	0.01214	-0.00297	-0.00127	0.03071	0.00415	-0.00282
	(0.04065)	(0.0405)*	(0.01351)*	(0.01960)*	(0.00665)*	(0.01697)*	(0.03084)*	(0.00910)*	(0.01376)*	(0.00142)*	(0.01419)	(0.00894)*	(0.00267)*
Central America	0.09494	0.08247	0.00457	0.00540	-0.00073	-0.02828	0.01808	0.01694	0.00432	-0.00138	0.03904	0.01274	-0.00189
	(0.02414)	(0.03593)	(0.01212)*	(0.01828)*	(0.00580)*	(0.01557)*	(0.02757)*	(0.00790)*	(0.01253)*	(0.00131)*	(0.01104)	(0.00790)*	(0.00250)*
Europe	0.08946	0.03671	-0.00761	-0.00233	-0.00486	-0.03069	-0.00053	0.01769	-0.00891	-0.00104	0.02409	0.00967	-0.00115
	(0.02626)	(0.03638)*	(0.01224)*	(0.01856)*	(0.00588)*	(0.01569)*	(0.02771)*	(0.00802)*	(0.01264)*	(0.00132)*	(0.01130)	(0.00800)*	(0.00253)*
Asia	0.06999	0.06139	-0.00421	0.00664	0.00131	-0.02730	0.00509	0.01265	-0.01251	-0.00095	0.03585	0.01690	-0.00183
	(0.02515)	(0.03676)*	(0.01213)*	(0.01836)*	(0.00582)*	(0.01564)*	(0.02757)*	(0.00790)*	(0.01258)*	(0.00131)*	(0.01113)	(0.00795)*	(0.00251)*
Africa	0.07110	0.00106	-0.01369	-0.00218	-0.00476	-0.02719	0.01416	0.00531	-0.01050	-0.00219	0.02125	0.00925	-0.00166
	(0.03242)	(0.04182)*	(0.01283)*	(0.01967)*	(0.00614)*	(0.01586)*	(0.03009)*	(0.00863)*	(0.01321)*	(0.00134)*	(0.01232)*	(0.00889)*	(0.00259)*
Oceania	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Years in the US													
N/A	0.04299	0.02735	0.00614	-0.00057	0.00814	0.00342	0.01968	0.00882	0.00724	0.00097	0.00404	0.00399	-0.00035
	(0.01688)	(0.01707)*	(0.00415)*	(0.00677)*	(0.00235)	(0.00448)*	(0.01432)*	(0.00379)*	(0.00491)*	(0.00042)	(0.00613)*	(0.00342)*	(0.00070)*
0-5	0.03292	0.05315	0.01373	0.00689	0.00258	0.00450	0.02097	0.00159	0.00480	0.00086	0.00623	0.00180	-0.00083
	(0.00539)	(0.00843)	(0.00274)*	(0.00414)*	(0.00173)*	(0.00338)*	(0.01047)*	(0.00319)*	(0.00300)*	(0.00031)	(0.00353)*	(0.00179)*	(0.00063)*
6-10	0.03749	0.04281	0.01153	0.00466	0.00392	0.00390	0.01609	0.00473	0.00442	0.00025	0.00588	0.00363	0.00024
	(0.00525)	(0.00699)	(0.00237)	(0.00354)*	(0.00158)*	(0.00277)*	(0.00880)*	(0.00259)*	(0.00268)*	(0.00027)*	(0.00331)*	(0.00163)	(0.00065)*
11-15	0.00467	0.03094	0.01197	-0.00081	0.00470	0.00428	0.01736	0.00752	0.00388	0.00027	0.01013	0.00221	-0.00032
	(0.00498)*	(0.00707)	(0.00226)	(0.00332)*	(0.00155)	(0.00267)*	(0.00840)*	(0.00252)	(0.00265)*	(0.00027)*	(0.00340)*	(0.00163)*	(0.00052)*
16-20	0.00720	0.02741	0.00548	-0.00825	0.00168	0.00108	0.00695	0.00532	0.00321	0.00052	0.00307	0.00293	0.00014
	(0.00515)*	(0.00759)	(0.00224)*	(0.00329)*	(0.00151)*	(0.00261)*	(0.00813)*	(0.00244)*	(0.00271)*	(0.00027)*	(0.00340)*	(0.00166)*	(0.00055)*
20+	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
English proficiency													
Not speak English	-0.01522	0.00940	-0.00281	-0.00916	-0.00445	0.00088	0.00444	-0.00699	-0.00256	-0.00039	-0.00466	-0.00288	0.00123
	(0.00396)	(0.00795)*	(0.00255)*	(0.00384)	(0.00244)*	(0.00436)*	(0.02042)*	(0.00584)*	(0.00352)*	(0.00048)*	(0.00394)*	(0.00179)*	(0.00124)*
Speak only English	-0.00088	-0.02791	-0.01056	-0.00509	-0.00599	-0.00773	-0.00394	-0.00786	-0.01781	-0.00030	-0.01262	-0.00169	-0.00034
	(0.00509)*	(0.00644)	(0.00205)	(0.00314)*	(0.00145)	(0.00247)*	(0.00898)*	(0.00285)	(0.00256)*	(0.00027)*	(0.00282)	(0.00144)*	(0.00053)*
Speak English very well	-0.01082	-0.02938	-0.01122	-0.00460	-0.00647	-0.00502	-0.00796	-0.01002	-0.02141	-0.00047	-0.01340	-0.00145	-0.00060
	(0.00487)	(0.00625)	(0.00194)	(0.00296)*	(0.00143)	(0.00242)*	(0.00893)*	(0.00282)	(0.00249)	(0.00026)*	(0.00277)	(0.00138)*	(0.00053)*
Speak English well	0.00580	-0.00709	-0.00070	0.00048	-0.00390	0.00397	0.01019	-0.00505	-0.00800	-0.00033	-0.00282	0.00235	-0.00005
	(0.00492)*	(0.00606)	(0.00197)*	(0.00313)*	(0.00155)	(0.00258)*	(0.01018)*	(0.00307)	(0.00266)	(0.00029)*	(0.00298)*	(0.00142)*	(0.00059)*
Speak English not so well	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Education attainment													
Without high school diploma	-0.01632	-0.02817	0.04153	0.01728	-0.00025	0.00738	0.01727	0.01127	0.00070	0.00042	-0.00837	-0.00293	0.00136
	(0.00731)	(0.00940)	(0.00208)	(0.00299)	(0.00137)*	(0.00248)*	(0.00517)	(0.00180)	(0.00166)*	(0.00015)	(0.00334)	(0.00135)	(0.00028)
With High school diploma	-0.01081	-0.01546	0.04525	0.02046	0.00032	0.01077	0.01883	0.01407	0.00708	0.00116	-0.00789	0.00054	0.00179
	(0.00720)	(0.00924)	(0.00199)	(0.00282)	(0.00132)*	(0.00237)	(0.00376)	(0.00133)	(0.00142)	(0.00013)	(0.00329)	(0.00129)*	(0.00023)
Associate degree	-0.00268	-0.01283	0.03793	0.01904	0.00165	0.01124	0.01324	0.01347	0.00790	0.00090	-0.00119	0.00205	0.00140
	(0.00729)*	(0.00929)*	(0.00196)	(0.00280)	(0.00132)*	(0.00238)	(0.00347)	(0.00127)	(0.00137)	(0.00012)	(0.00330)*	(0.00131)*	(0.00021)
Bachelor degree	0.01323	0.00323	0.02533	0.01133	0.00059	0.00927	0.01001	0.01098	0.00625	0.00054	-0.00059	0.00177	0.00098
	(0.00784)*	(0.00988)*	(0.00202)	(0.00285)	(0.00139)*	(0.00254)*	(0.00354)*	(0.00128)	(0.00142)	(0.00012)	(0.0035)*	(0.00145)*	(0.00021)
Master's +	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Income													
new income	0.05719	0.15166	0.06500	0.04687	0.06359	0.04036	0.05887	0.03544	0.05955	0.01143	0.15107	0.04818	0.00690
	(0.00126)	(0.00118)	(0.00079)	(0.00129)	(0.00084)	(0.00094)	(0.00123)	(0.00069)	(0.00065)	(0.00024)	(0.00145)	(0.00108)	(0.00037)
N	33,395	98,973	163,896	42,773	171,229	73,188	32,202	98,180	158,653	346,070	129,527	72,929	77,521

Marginal effects; Standard errors in parentheses
(d) for discrete change of dummy variable from 0 to 1
*indicates statistically insignificant results since p>0.05

Table A7: Marginal Effects of worker characteristics and skills on the likelihood of employment (2005)

	Agri.	Const.	Manu.	Wholesale Tr.	Retail Trade	Transp. & Utilities	Info. Comm.	Finance	Prof. Ser.	Educ. & Health Services	Rec. & Food Services	Other Services	Public Administration
Citizenship													
newcitizen	0.01015	-0.01632	-0.00372	-0.00159	-0.00162	-0.00496	-0.01728	-0.00250	-0.00342	-0.00008	-0.00627	-0.00542	-0.00007
	(0.00534)*	(0.00478)	(0.00193)	(0.00281)*	(0.00297)*	(0.00264)*	(0.00700)	(0.00276)*	(0.00243)*	(0.00106)*	(0.00337)*	(0.00323)*	(0.00206)*
Sex													
sex	-0.00852	0.02031	0.00435	-0.00039	0.00808	0.00378	0.01490	0.00515	0.00857	0.00510	0.00608	0.01069	0.00203
	(0.00196)	(0.00236)	(0.00069)	(0.00104)*	(0.00083)	(0.00088)	(0.00193)	(0.00083)	(0.00077)	(0.00038)	(0.00095)	(0.00112)	(0.00042)
Age													
16-24	-0.05546	-0.04879	-0.02031	-0.02366	-0.05271	-0.02029	-0.03857	-0.02031	-0.04209	-0.01523	-0.05345	-0.05433	-0.01038
	(0.00409)*	(0.00473)	(0.00217)	(0.00301)	(0.00238)	(0.00229)	(0.00641)	(0.00226)	(0.00230)	(0.00091)	(0.00369)	(0.00301)	(0.00120)
25-34	-0.0481	-0.04189	-0.01236	-0.02212	-0.05448	-0.01659	-0.0359	-0.02158	-0.03809	-0.01216	-0.05429	-0.0479	-0.0076
	(0.00413)*	(0.00466)	(0.00211)	(0.00292)	(0.00247)	(0.00218)	(0.00631)	(0.00217)	(0.00223)	(0.00088)	(0.00380)	(0.00302)	(0.00110)
35-44	-0.04036	-0.04463	-0.01199	-0.02086	-0.04702	-0.01462	-0.03936	-0.02149	-0.03777	-0.01092	-0.04687	-0.04297	-0.00548
	(0.00402)*	(0.00463)	(0.00208)	(0.00291)	(0.00249)	(0.00214)	(0.00634)	(0.00218)	(0.00224)	(0.00088)	(0.00386)	(0.00299)	(0.00109)
45-54	-0.03748	-0.04505	-0.01465	-0.02148	-0.04026	-0.01119	-0.04443	-0.02114	-0.03499	-0.0094	-0.04035	-0.0414	-0.00632
	(0.00397)*	(0.00464)	(0.00207)	(0.00290)	(0.00249)	(0.00213)	(0.00632)	(0.00218)	(0.00224)	(0.00087)	(0.00391)	(0.00297)	(0.00109)
55-64	-0.02575	-0.03986	-0.01319	-0.01829	-0.02756	-0.01004	-0.03656	-0.01732	-0.02797	-0.00701	-0.02214	-0.02731	-0.00542
	(0.00426)*	(0.00486)	(0.00214)	(0.00301)	(0.00261)	(0.00222)	(0.00655)	(0.00225)	(0.00232)	(0.00091)	(0.00422)	(0.00314)	(0.00112)
65+	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Birthplace													
USA	0.03038	0.0197	-0.01793	0.01032	-0.03096	0.01066	-0.03301	-0.03053	-0.03149	-0.00411	-0.00655	0.00292	0.02122
	(0.03497)*	(0.03498)*	(0.01765)*	(0.02383)*	(0.01920)*	(0.01267)*	(0.03845)*	(0.02095)*	(0.01891)*	(0.00554)*	(0.01705)*	(0.02054)*	(0.00661)
North America	0.05827	-0.00019	-0.00915	0.00733	-0.02294	0.02049	-0.02843	-0.01549	-0.02242	0.00077	0.00604	0.0056	0.02301
	(0.03762)*	(0.03555)*	(0.01822)*	(0.02447)*	(0.01987)*	(0.01511)*	(0.03807)*	(0.02157)*	(0.01923)*	(0.00574)*	(0.01836)*	(0.02102)*	(0.00783)
Central America	0.04922	0.02116	-0.0046	0.01675	-0.02153	0.01617	-0.0187	-0.01996	-0.0197	0.00054	0.0188	0.01264	0.01953
	(0.03013)*	(0.03274)*	(0.01718)*	(0.02296)*	(0.01822)*	(0.01187)*	(0.03599)*	(0.02047)*	(0.01822)*	(0.00523)*	(0.01579)*	(0.01917)*	(0.00583)
Europe	0.06315	0.00575	-0.0128	0.01216	-0.02556	0.01704	-0.02852	-0.01998	-0.02844	0.00182	0.00714	0.01307	0.01625
	(0.03226)*	(0.03304)*	(0.01728)*	(0.02316)*	(0.01837)*	(0.01215)*	(0.03613)*	(0.02054)*	(0.01831)*	(0.00529)*	(0.01602)*	(0.01944)*	(0.00590)
Asia	0.00879	-0.00423	-0.01198	0.01352	-0.01796	0.01643	-0.02496	-0.02138	-0.0341	-0.00015	0.01558	0.02065	0.01731
	(0.03088)*	(0.03333)*	(0.01721)*	(0.02301)*	(0.01825)*	(0.01199)*	(0.03601)*	(0.02048)*	(0.01826)*	(0.00524)*	(0.01589)*	(0.01931)*	(0.00582)
Africa	0.01678	-0.02889	-0.01535	0.007	-0.03046	0.00728	-0.04344	-0.02592	-0.03173	0.00081	0.00963	0.01542	0.02287
	(0.03821)*	(0.03730)*	(0.01794)*	(0.02406)*	(0.01894)*	(0.01236)*	(0.03817)*	(0.02099)*	(0.01881)*	(0.00549)*	(0.01795)*	(0.02059)*	(0.00697)
Oceania	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Years in the US													
N/A	0.01363	0.0018	0.01384	0.00504	0.00426	0.00718	0.0185	0.01172	0.00594	0.00551	0.0198	0.01099	-0.00282
	(0.01823)*	(0.01263)*	(0.00437)	(0.00677)*	(0.00656)*	(0.00488)*	(0.01444)*	(0.00492)	(0.00536)*	(0.00199)	(0.00708)	(0.00769)*	(0.00337)*
0-5	0.03143	0.04357	0.01818	0.01047	0.00384	0.0041	0.0004	-0.0002	0.01217	0.00106	0.01667	-0.00253	0.00071
	(0.00546)	(0.00587)	(0.00274)	(0.00399)	(0.00418)*	(0.00386)*	(0.00989)*	(0.00412)*	(0.00322)	(0.00147)*	(0.00440)	(0.00431)*	(0.00280)*
6-10	0.01769	0.03016	0.01192	0.01065	0.00649	0.00868	0.00845	0.00139	0.00403	0.00033	0.00968	-0.00164	0.00329
	(0.00567)	(0.00577)	(0.00259)	(0.00383)	(0.00397)*	(0.00366)	(0.00920)*	(0.00365)*	(0.00306)*	(0.00140)*	(0.00427)	(0.00426)*	(0.00281)*
11-15	0.00194	0.02606	0.00821	0.00344	-0.00068	0.00396	0.00005	-0.00048	0.00761	0.00252	0.01091	-0.003	0.00117
	(0.00546)*	(0.00616)	(0.00247)	(0.00351)*	(0.00377)*	(0.00347)*	(0.00863)*	(0.00334)*	(0.00315)	(0.00137)*	(0.00429)	(0.00399)*	(0.00242)*
16-20	0.00367	0.01767	0.00221	0.00121	0.00045	0.00249	0.00412	0.00141	0.00113	0.00047	0.00747	-0.0023	0.00304
	(0.00546)*	(0.00585)	(0.00237)*	(0.00339)*	(0.00378)*	(0.00317)*	(0.00838)*	(0.00337)*	(0.00303)*	(0.00132)*	(0.00417)*	(0.00395)*	(0.00242)*
20+	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
English proficiency													
Not speak English	-0.0067	0.00585	-0.00276	-0.00558	0.00118	-0.00644	-0.02452	0.00115	-0.00331	-0.00194	-0.00781	-0.00583	0.00142
	(0.00407)*	(0.00571)*	(0.00265)*	(0.00383)*	(0.00592)*	(0.00539)*	(0.01779)*	(0.00928)*	(0.00369)*	(0.00238)*	(0.00488)*	(0.00447)*	(0.00562)*
Speak only English	0.00597	-0.02217	-0.00812	0.00275	-0.0018	0.00011	0.00935	-0.01289	-0.01568	0.00117	-0.01987	-0.00836	0.00179
	(0.00508)*	(0.00480)	(0.00219)	(0.0032)*	(0.00331)*	(0.0031)*	(0.00864)*	(0.00438)	(0.00281)	(0.00127)*	(0.00344)	(0.00348)	(0.00224)*
Speak English very well	-0.0043	-0.02323	-0.00934	-0.00373	-0.00887	-0.00292	0.00324	-0.01498	-0.02044	-0.00133	-0.01871	-0.01063	0.00035
	(0.0051)*	(0.00479)	(0.00211)	(0.00306)*	(0.00331)	(0.00305)*	(0.00874)*	(0.00436)	(0.00277)	(0.00126)*	(0.00343)	(0.00343)	(0.00227)*
Speak English well	0.00489	-0.00914	-0.00438	-0.00274	-0.00089	0.00369	0.00987	-0.0137	-0.01018	0.00129	-0.00887	-0.00358	-0.00264
	(0.00504)*	(0.00486)*	(0.00215)	(0.00321)*	(0.00367)*	(0.00331)*	(0.01009)*	(0.00467)	(0.00302)	(0.00141)*	(0.00369)	(0.00348)*	(0.00249)*
Speak English not so well	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Education attainment													
Without high school diploma	-0.02906	-0.02952	0.02653	0.00574	0.00214	0.00231	-0.00117	0.00022	-0.01587	-0.00358	-0.01449	-0.00793	0.00162
	(0.00704)	(0.00671)	(0.00199)	(0.00306)*	(0.00308)*	(0.00286)*	(0.00483)*	(0.00217)*	(0.00172)	(0.00067)	(0.00388)	(0.00275)	(0.00107)*
With High school diploma	-0.01214	-0.01317	0.03471	0.01352	0.00873	0.0094	0.01219	0.01104	-0.00279	0.00227	-0.00899	-0.00018	0.0062
	(0.00698)	(0.00664)	(0.00191)	(0.00293)	(0.00299)*	(0.00276)	(0.00393)	(0.00172)	(0.00150)	(0.00055)	(0.00384)	(0.00259)*	(0.00084)
Associate degree	-0.00414	-0.00187	0.03228	0.0138	0.01258	0.00824	0.01077	0.01075	0.00483	0.00315	0.00357	0.0052	0.0057
	(0.00711)*	(0.00669)*	(0.00193)	(0.00294)	(0.00301)*	(0.00277)	(0.00371)	(0.00165)	(0.00148)*	(0.00053)	(0.00389)*	(0.00263)	(0.00080)
Bachelor degree	0.00986	0.01061	0.02147	0.01073	0.00878	0.00712	0.00693	0.00844	0.00608	0.00184	0.00247	0.0335	0.00388
	(0.00774)*	(0.00720)*	(0.00203)	(0.00306)	(0.00319)*	(0.00296)*	(0.00378)*	(0.00168)	(0.00155)	(0.00056)	(0.00416)*	(0.00296)*	(0.00083)
Master's +	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Income													
newincome	0.0333	0.06143	0.04371	0.03092	0.07044	0.03199	0.03773	0.02365	0.04104	0.02737	0.12879	0.05482	0.01549
	(0.00114)	(0.00088)	(0.00050)	(0.00076)	(0.00072)	(0.00069)	(0.00096)	(0.00042)	(0.00050)	(0.00034)	(0.00134)	(0.00103)	(0.00058)
N	30,858	103,678	171,343	49,578	163,495	70,262	34,590	100,064	137,667	298,580	113,680	67,173	68,584

Marginal effects; Standard errors in parentheses
(d)for discrete change of dummy variable from 0 to 1
*indicates statistically insignificant results since p>0.05

Evidence Tracker

Objective	Work in Design Matrix	Analysis (summary of the results of each piece of major work)	Remaining work	Questions
Objective 1: Industry level analysis	Literature Review.	Most of the literature examined 10-year time periods of the American Community Survey data.		
	Exploring, identifying and cleaning data sets.	We obtained ACS micro level data from IPUMS.org. The data for 2000, 2005, 2010 and 2015, was downloaded to analyze recent trends.		Selected 2000, 2005, 2010 and 2015 ACS micro-level data. Is that okay? An analysis of 2000-2015 is not feasible given the extremely large data sets and changes to ACS methodologies mid-period.
a. To identify the industries that employ the highest proportion of immigrant (non-citizen) workers.	Literature Review.	• Different literature showed different industry level patterns. A report by Brookings Institution showed Private Household, followed by Accommodation as employing the highest percentage of immigrants. The other top industries, in descending order were: Warehousing; Management & Administration; Agriculture; Food Services; and Construction. The industries with the lowest proportion of immigrant workers were: Utilities; Public Administration; and Arts & Entertainment.	Comparing final results with the literature.	• Preferred population classification for analysis - Citizenship or immigration? Refer to tables I and II in the slides. • Should people employed in the Armed Forces be included in the analysis or be dropped from the data set? The literature does not indicate one clear treatment of the same.
	Data coding and analysis.	• Codebooks and coding: a. Industry classification is available for people who are either in the labor force currently or have worked in the past five years. b. NAICS classifies industries into sectors and sub-sectors. For this study, sector-wise classification was used. • Industry concentration of non-citizen and immigrant workers displays a similar trend. A comparison of Tables I & II highlights the exact differences.	Rename variables in the Stata file.	
b. An analysis of Immigrant's (non-citizen's) comparable skills across industries.	Literature Review & Expert Consultation.	• Language was often used as important indicator of skill, in addition to education attainment. Most studies acknowledged that though skills and qualification of workers exceeded mere education qualification, the correlation is still high. Some studies highlighted this difference to be even more prominent among immigrant workers. • Our consultation with experts on census data collection revealed that occupation would also be a good indicator to bridge this gap between indicators of skills. • Brookings report designated individuals with a Bachelor's degree or more as high-skilled, those without a high school diploma as low-skilled, and those with at least a high school diploma but less than a college degree as middle-skilled. Among key sectors with lower- skilled workers, (eg: accommodation) immigrant education lags. However, in high-skilled industries such as high-tech manufacturing, immigrant and native workers share similar levels.	Ran into some issues with the occupation variable. The new variable has to be coded and included in the model.	Are English proficiency, level of education and occupation within the industry good indicators of skill?
	Data coding and analysis.	The detailed variable for education attainment was extracted. Subsequently, it was coded into being a categorical variable, with five categories, in conformity with report of the Department of Labor.	Include occupation and spoken English ability.	
What does ALL of the collected evidence say about the objective?	Evidence so far: **Tables I & II:** The highest percentage of immigrants were hired in Educational, Health & Social Services; followed by Professional Scientific, Management, Administrative, and Waste Management Services; Manufacturing; Arts, Entertainment, Recreation, Accommodations, & Food Services; and Retail Trade at the fifth place. **Table III:** Educational qualification and the proportion of immigrants have an inverse trend; i.e., the highest percentage of immigrants in 2015 had no high school diploma or an equivalent qualification, while the lowest proportion, 13.14% had a master's degree or higher. Regarding the educational attainment in specific industries, our analysis shares a similar result with Brookings' report. Among the low-skilled, immigrant education lags. For example, in the Manufacturing industry, 36% of native-born workers have at least high school degree, compared to 21% among immigrants; Only 9% of native born workers do not have a high school diploma, compared but 37% among immigrants. Different from the Brooking's studies, in the high skilled workers – generally a higher percentage of native born workers have Bachelor's degree than immigrants, but a higher percentage of immigrant workers have Master's or Advanced degree. A limitation of this research is that it does not account for illegal immigrants, who may fit anywhere on the spectrum.			

Objective 2: Individual employment patterns	Literature review of the regression models used.	Literature and experts suggested using either the LPM, Probit or Logit models. The LPM has obvious shortcomings (eg: some predicted probabilities using LPM may have values that are less than 0 or greater than 1), and therefore, the Probit models seems the most appropriate at this stage.	Further investigation to decide on the most appropriate model to assess likelihood given the control variables.	
	Exploring data.	• We obtained ACS micro-level data from IPUMS.org. The data for 2000, 2005, 2010 and 2015, was downloaded to analyze recent trends. • The dataset includes variables like age, sex, race, occupation, birthplace, language to assess individual employment patterns while control for other factors.		

a. What is the likelihood for an immigrant to be employed in a given industry, when factors like education, race and region of origin are held constant?	Coding and understanding the Data.	• Important coding work included:
		  a. Running summary and descriptive statistics for each of the variables to understand them, and to ensure that they are all in comparable units.
		  b. Some continuous variables like age, and categorical variables like race were converted to categorical variable, following the literature for likelihood and probability analysis.
		  c. The raw data enlists individual countries of origin; however IPUMS and the literature classifies these into broader regions. For the regression analysis, country of origin/ birth place was coded into a categorical variable.
			Present a cohesive analysis of this empirical study, alongside the literature examined.	

	Running and interpreting the regressions.	The Probit model has yielded preliminary results, but further investigations is needed.	Interpret the outcomes of the regression.	
b. Identify how different is this trend for different industries and across different regions?	Regional classification to be used.	The Census classifies regions into four regions (Northeast, Midwest, South, West) and nine divisions (New England Division, Middle Atlantic Division, East North Central Division, West North Central Division, South Atlantic Division, East South Central Division, West South Central Division, Mountain Division, Pacific Division). Feeding regions into the descriptive tables, and then summarizing the results.	• Run regression for different regions and interpret the outcome. • Map the regional outcomes of the data.	What would be the preferred classification of region - four Regions or the nine Divisions?

What does ALL of the collected evidence say about the objective?	The identified regression model will be used to study the likelihood relationship identified in the Design Matrix and to identify how other factors (control variables) such as occupation impact employment status, impact or explain this relationship further.
	    MPI report found that immigrants were more likely be employed as lower-skilled craftsmen/operatives, especially as non-farm laborers than natives by 2000. On the other hand, native born workers were less likely to be employed in professional, technical and kindred jobs comparing to immigrants.
	    According to another Brookings report, eastern part of the United States are highly concentrated with high skilled workers, especially in NY, MA, OH, SC, etc. While moving from the east to the west part of the United State, more low-skilled immigrant workers were concentrated. The metropolitan areas in states like TX, NM, AZ were almost consisted by low-skilled immigrants. Authors also found that low-skilled immigrants had higher rates of employment, compared with this U.S-born counterparts.
	    Another MPI report analyzed data from the 2012 Program for the International Assessment of Adult Competencies (PIAAC), and the study found there is not a strong correlation between cognitive skills and employment for immigrant labors, at the similar skill level, immigrants with low English literacy and numeracy proficiency were more likely to be employed than the native-born counterparts. However, regarding income level, literacy and numeracy skills were strongly associated with differences in income for both immigrants and natives. In average, immigrants earned less than native born counterparts, but once the literacy and numeracy level has been controlled, the differences significantly decreased. As a result, the study found that most of immigrants can find jobs even with low cognitive skills. But a higher literacy and numeric skills are necessary for them to earn a higher level of income.			