Senior Project

Department of Economics

"What Effect Does Immigration Have On The Native Unemployment Rate?"

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Abstract

This cross-section study observes the effect that immigration has on native unemployment rates in each state in the United States for 2016. The employment share of foreign born workers in the labor force and other labor market characteristics were used to estimate the change in native unemployment rates by state. Based on theory stating that as more immigrants enter the labor market, the labor supply should increase, and unemployment should also increase. Using OLS regression, it was shown that the employment share did not have significance in explaining for the percentage change in native unemployment rate. Other labor market characteristics, such as having a bachelor's degree, a high school diploma, or the percentage of females in the labor force, did have significant impact on native unemployment rate.

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Introduction

Immigration in the United States is a topic being talked about almost daily due to federal policies concerning immigration becoming stricter. Even though it is perfectly legal for immigrants to come to the United States through the proper protocol and documentation, natives tend to have a negative view of recent immigrants migrating into the country. While general bigotry is a factor that comes into play with this mindset, another factor that also plays into this is the fear of job displacement for natives (Grossman, 1982). In order to figure out if natives have an adequate rationale for having a fear of job displacement, the goal for this paper is to determine what the effect of immigration inflows has on unemployment rates of native workers across the United States. More specifically, this study will determine if a higher concentration of foreign born labor will cause an increase in the native unemployment rate.

Before 1990, the largest share of immigrants in high-income countries came from other high-income countries, but this has changed since then. The growth of the foreign-born populations in these higher income countries have stemmed from growing populations from lower-income countries from Asia, Africa, and Latin America (Peri, 2016). This increase in immigration from lower-income countries have two attributes. First, countries with mid-level economic development experience the biggest emigration rates to higher income countries. Second, while popular belief may be that immigrants tend to have a low level of education, the opposite is true. Immigrants, even originating from poor countries, tend to have a higher level of education (Peri, 2016). Even if they have lived in a host country for an extended period of time, immigrants with similar skillsets to natives will tend to seek a job that have lower skill requirements (Haas, Lucht, & Schanne, 2013). The substitutability of immigrants and natives is

important for being able to research migration rates to allow for a more accurate analysis of labor market outcomes (Haas, Lucht, & Schanne, 2013).

Literature Review

There have been different methods of analysis when determining the effect that immigration inflows have had on the labor market across several international studies. Most of the studies had different definitions for measuring the impact of immigration and different methods for accounting the human capital traits in workers. Another key component in the literature was measuring substitutability of native and foreign-born workers. Knowing the elasticity between the two labor groups is key in understanding how native unemployment rate is affected by immigration. In this study, it will be shown if immigration has a similar effect on natives in the United States such as native workers in the international studies.

Estimating Unemployment Rate & Measuring Immigration

The studies that were reviewed had various ways in measuring how immigration affected unemployment rate and native unemployment rate. A Danish pooled cross-sectional study used a log-linear model using the employment of foreign born workers to labor force share as the main control variable in 99 different municipalities to (Strielkowski & Troshchenkov, 2013). Using this share for all foreign-born workers and then exclusively foreign born workers from non-western countries, Strielkowski & Troshchenkov (2013) finds that there is a positive but insignificant impact of immigration of all foreign born workers and non-western foreign born workers on total unemployment rate. The share of immigrants in a certain occupation set can affect the level of native unemployment in a specific occupation. Braun & Mahmoud (2014) did an analysis of post-WWII German deportees from Eastern Bloc territories into Western Germany

and found that an increase in the employment share of deportees by 10 percentage points of an

occupation decreased West German employment by 2.6 percentage points. In a related study

using the immigrant share of employment, Ortega & Verdugo (2014) used that share in

measuring its impact on native earnings in France. They concluded that earnings and

immigration inflows have a strong positive correlation (Ortega & Verdugo, 2014). Latif (2015)

performed a panel data study in Canadian provinces using the immigration rate, which is defined

as total annual migrant flow divided by the total population. Real GDP per capita in each

province was also taken into account in measuring unemployment rate due to different levels of

skill affecting the physical capital to labor ratio. When immigrants have a higher level of

education on average, then that ratio doesn't decrease from an influx of lower skilled immigrants

(Latif, 2015).

Complements vs. Substitutes

The substitutability, or elasticity, of immigrants and natives can give a clearer picture of

how newer inflows of immigrants can affect local labor markets. Grossman (1982) looked at the

substitutability of immigrants, natives and second-generation natives, meaning natives with

foreign born parents, in the United States by estimating a translog production function to

determine the elasticities between the labor groups. The results show that second-generation

native and other native workers have a higher substitution effect on natives than foreign born

workers (Grossman, 1982). When looking at specific skill sets and tasks internationally,

immigrants and natives with the low skill sets are more substitutable than workers with medium

to high skill sets (Haas, Lucht, & Schanne, 2013). Haas, Lucht, and Schanne (2013) categorized

these tasks in two different fashions, being analytical, manual, or interactive, and if they were

routine or non-routine.

Summary of Literature

The literature reviewed was largely based off of international studies that were performed within the last 10 years. The reasoning for using these studies was to find out how the empirical model in this paper would be defined based off of the type of data each study used and how it best fit with the data gathered in this study. In this study, the model from Strielkowski & Troshchenkov's (2013) pooled cross-section study will be reformed to represent a one-year cross-section estimate of native unemployment. The elasticity between native and foreign born workers is also an important topic in this study due to the fact that the effect that immigration will have on native unemployment rate can give us a better idea for the substitutability of native workers and foreign born workers.

Economic Theory

There are two beliefs in labor economics that immigrants can either act as complements or substitutes to native workers (Borjas, 2013). In the hypothetical case that natives and immigrants being perfect substitutes, as the amount of immigration inflows increases, the overall labor supply should also increase, which cause a shift of the labor supply curve to the right (Borjas, 2013). Since the minimum wage in the United States prevents wages from falling too low, a surplus of overall employment will occur, which in turn can cause an increase in unemployment. For this reason, natives may have a logical reasoning behind a fear of displacement depending on the amount of foreign inflows. Although, occupations that aren't affected by the minimum wage should not experience this increase in unemployment due to the equilibrium wage being higher than the minimum wage. On the other hand, if immigrants act as perfect complements, then this will cause an increase in the demand of labor and increase wages and the level of employment for natives (Borjas, 2013). In the case immigration impacts certain

regions more the others, one may expect to see native workers in heavily impacted regions seeking employment in a different region. This process, in the long run, will help spreading the effect of immigration from a specific region to the entire country (Borjas, 2013).

Data

The data that was collected for the native unemployment rate and foreign labor force was gathered using the American Factfinder Tool from the U.S. Census Bureau. These variables were gathered for the year 2016, and for each state in the United States including the District of Columbia and Puerto Rico. The unemployment rate gathered for natives was as a percentage of the native civilian labor force over the age of 16, while the foreign employment rate and foreign born civilian labor force over the age of 16 were used in order to calculate the employment share of foreign born workers, which is the main explanatory variable.

To account for labor market characteristics that could also affect native unemployment rate, data was gathered for the percentage of people in a specific occupation group, percentage of people with a certain level of educational attainment, percentage of the labor force that is female, and the percentage of people over the age of 55. There are five major occupation groups used in this study: Management, Business, Science, and Arts occupations, Service occupations, Sales and Office occupations, Natural Resources, Construction, and Maintenance occupations, and Production, Transportation, and Material Moving occupations. The educational attainment variables were gathered as a percentage of people reaching their highest level of education. They were separated out as high school graduate (or equivalent), some college or associate's degree, bachelor's degree, and graduate or professional degree. Any level of education that is lower than a high school graduate was included as the reference variable in the empirical model. The data for these education and occupation variables was gathered from the Census's American

Factfinder tool, while the ratios of females in the labor force and of workers over the age of 55 in the labor force were both gathered per state from the Bureau of Labor Statistics.

Empirical Model

The model being used is an adaptation from Strielkowski and Troshchenkov's (2013) log-linear model for explaining total unemployment. The model is defined as follows:

$$Ln(URateN_i) = \beta_0 + \beta_1 EmpShareF_i + \beta_2 LFRatio_i + \beta_3 SelfEmp_i + \beta_4 MBSA_i +$$
$$\beta_5 Serv_i + \beta_6 Sales_i + \beta_7 NRCM_i + \beta_8 PTMM_i + \beta_9 HighS_i + \beta_{10} ASColl_i + \beta_{11} Bach_i +$$
$$\beta_{12} Grad_i + \beta_{13} FLF_i + \beta_{14} Age55_i + \varepsilon_i$$

Contrary to Strielkowski and Troshchenkov's (2013) study, this study is only looking at the native unemployment rate for one year rather than three years, which means that dummy variables accounting for time fixed effects can be excluded. The log of the dependent variable URateN, or native unemployment rate, is estimated using an OLS regression. The main explanatory variable used in this model will be EmpShareF, defined as the foreign born employment share in the labor force.

The other independent variables in the model were used to account for the statewide labor market characteristics based on human capital and some socioeconomic factors. These variables include the percentages of workers that have a specific occupation, percentage of workers with a specific level of educational attainment, percentage of the labor force that is female, and the percentage of the labor force over 55 years of age. The five different occupation variables include MBSA (Management, Business, Science, & Art), Serv (Service), Sales (Sales and Office), NRCM (Natural Resources, Construction, and Maintenance), and PTMM (Production, Transportation, and Material Moving). The educational attainment variables include HighS

(High School Diploma), ASColl (Associate's Degree or Some College), Bach (Bachelor's Degree), and Grad (Master's Degree or higher). LFRatio (Labor force to population ratio), Age55 (Percentage of workers over the age of 55), FLF (Percentage of Females in Labor Force), and SelfEmp (Percentage of workers that are self-employed) were included in this model to also account for statewide labor market conditions.

Due to the fact that immigration generally increases the labor supply in the labor market, we should expect an increase in native unemployment rate with higher employment shares of foreign born workers in the labor force. However, other labor market factors do contribute to changes in unemployment rate in addition to immigration (Strielkowski & Troshchenkov, 2013). The other labor market factors signs are not able to be predicted because of different labor markets having different necessities for education and skills. The signs for the percentage of females and workers older than 55 in the labor force also can't be predicted due to differences in labor market characteristics (Strielkowski & Troshchenkov, 2013).

Results

Estimating the log-linear model using OLS regression, which can be found on Table 2, it was found that the effect of the employment share of immigrants in the labor force was not statistically significant in explaining for native unemployment rate. This is more than likely due to some states having a smaller proportion of foreign born individuals in the total population. Most of the educational attainment variables, with the exception of Grad, are statistically significant with 95 percent confidence. This could mean that the educational attainment of all migrants, including both foreign and native migrants, has more of an impact on the unemployment of natives than the share of employment of foreigners. The percentage of female in the labor force has a negative and statistically significant in explaining native unemployment

rate, which could mean that gender differences in migrants could have some say in determining changes in unemployment rate.

There are some limitations with the model and could cause some unforeseen bias in the results. In gathering the data by state for 2016, one-year estimates were used so that way the model would estimate more current results. Using this data caused the number of observations to fall from 51 to 42 since some states didn't have one-year estimates in the data gathered from the Census's American Factfinder Tool. If five-year estimates are used instead, then the number of observations that can be used in this study will be 51, which would lead to a more robust analysis of the economic problem. Due to the low number of observations, the F-Value for the model is 9.11, which is a low value compared to most model, but still strong enough to use for explaining an effect on native unemployment rate. Another limitation to this model is that there could be multicollinearity between some of the independent variables, namely the variables accounting for educational attainment and the occupation group variables. The level of educational attainment an individual has could lead to which occupation group that they are a part of.

To account for the multicollinearity that could exist between the occupation and the educational attainment variables, two separate models were created; one with the occupation variables excluded and the other with the educational attainment variables excluded. In both model, the employment share of foreign born workers was still statistically insignificant in explaining for the log of native unemployment rate. In the model without occupation variables, shown in Table 3, HighS and Bach were found to be statistically significant at the 90 percent and 99 percent levels respectively, while FLF was significant with 95 percent confidence. Shown in Table 4, for the model without education variables, FLF was the only variable statistically significant at the 99% level.

Conclusion

To conclude this paper, the two general ideas when discussing immigrants and natives is that they are either substitutes or complements. If the two are substitutes, then that implies that an influx in foreign born inflows would lower the wage in the labor market and potentially cause higher unemployment rates if there is a minimum wage. Using OLS regression on the log-linear model, it was shown that the employment share of foreign born workers per state has a negative impact on native unemployment rate, but that impact is statistically insignificant and can be disregarded in this model. Educational attainment, with the exception of individuals with a graduate degree, have more of a significant impact when measuring the change of unemployment rate in native workers per state. The percentage of females in the labor force also has significance in explaining the dependent variable, which could mean gender differences among workers could explain for changes in native unemployment rates in different states.

While the employment share of foreign born workers in the labor force may not have a significant impact in explaining native unemployment rate, it does not mean that policy implications can be determined right away from this information. In order to determine policy changes towards immigration, the impact of immigration on native wages and all wages needs to be measured as well in order to find out the impact immigration has on the labor market in general. It may also be imperative to measure the differences in wage change or unemployment change based on the migrant's occupation, educational attainment, or other socioeconomic factors.

Appendix

Descriptive Statistics						
Variable	Description	Source	Mean	St. Dev.	Min	Max
URateN	Native Unemployment Rage	Census	5.6714	1.0966	3.5000	7.8000
EmpShareF	Foreign Born Employment Share in Labor Force	Census	12.8692	7.5694	4.3951	32.8704
LFRatio	Labor Force to Population Ratio	Census	0.4977	0.0312	0.4456	0.5755
SelfEmp	Percentage of Labor Force that is Self Employed	Census	5.7071	0.9298	3.9000	8.2000
MBSA	Percentage of Labor Force in the Management, Business, Science, & Art Occupation Group	Census	37.8619	5.1209	28.9000	61.4000
Serv	Percentage of Labor Force in Services Occupation Group	Census	17.9310	2.0361	15.6000	26.5000
Sales	Percentage of Labor Force in Sales & Office Occupation Group	Census	23.2214	1.6220	15.7000	26.3000
NRCM	Percentage of Labor Force in Natural Resources, Construction, & Maintenance Occupation Group	Census	8.7333	1.4427	3.0000	11.4000
PTMM	Percentage of Labor Force in Production, Transportation, and Material Moving Occupation Group	Census	12.2405	2.9897	4.1000	18.4000
HighS	Percentage of Labor Force with a High School Diploma	Census	27.7476	4.0079	17.8000	35.1000
ASColl	Percentage of Labor Force with Some College or an Associate's Degree	Census	29.4000	3.8876	15.9000	36.5000
Bach	Percentage of Labor Force with a Bachelor's Degree	Census	19.3333	2.7912	14.0000	24.9000
Grad	Percentage of Labor Force with a Master's Degree or Higher	Census	12.2524	4.2343	8.1000	32.9000
FLF	Percentage of Females in the Labor Force	BLS	58.0071	3.9700	50.8000	66.5000
Age55	Percentage of Workers over the Age of 55 years old	BLS	22.5526	2.2619	16.3265	28.6285

Table 1: Descriptive Statistics

OLS Regression (Dependent Variable = lnURateN			
Variable	Parameter Estimate	SE	t-value
Intercept	-22.48735	25.89862	-0.87
EmpShareF	-0.00254	0.00489	-0.52
LFRatio	0.46906	2.55386	0.18
SelfEmp	-0.03853	0.02776	-1.39
MBSA	0.30149	0.26092	1.16
Serv	0.31900	0.25859	1.23
Sales	0.27007	0.26246	1.03
NRCM	0.26135	0.25968	1.01
PTMM	0.28440	0.25747	1.10
HighS**	-0.04014	0.01716	-2.34
ASColl**	-0.02983	0.01424	-2.09
Bach**	-0.04333	0.01941	-2.23
Grad	-0.03122	0.03333	-0.94
FLF*	-0.03337	0.01818	-1.84
Age55	0.00880	0.01155	0.76
Number of Observations		42	
Adj. R-Square		0.7347	
Root MSE		0.1067	
F Value		9.11	

Table 2: OLS Regression; ** and * represent statistical significance at the 95% and 90% levels respectively

OLS Regression (Dependent Variable = lnURateN			
Variable	Parameter Estimate	SE	t-value
Intercept	5.34667	0.98853	5.41
EmpShareF	0.00457	0.00353	1.29
LFRatio	1..11272	2.26262	0.49
SelfEmp	-0.03441	0.02558	-1.35
HighS*	-0.02885	0.01657	-1.74
ASColl	-0.02017	0.01305	-1.55
Bach***	-0.05177	0.01609	-3.22
Grad	0.00618	0.01611	0.38
FLF**	-0.03416	0.01642	-2.08
Age55	0.01121	0.01169	0.96
Number of Observations		42	
Adj. R-Square		0.7194	
Root MSE		0.10971	
F Value		12.68	

Table 3: OLS Regression (without occupation variables), ***, **, and * represents statistical significance at the 99%, 95%, and 90% respectively

OLS Regression (Dependent Variable = log(URateN)			
Variable	**Parameter Estimate**	**SE**	**t-value**
Intercept	-14.93599	26.29867	-0.57
EmpShareF	0.00087372	0.00364	0.24
LFRatio	0.16918	2.67610	0.06
SelfEmp	-0.02228	0.02489	-0.90
MBSA	0.20698	0.26302	0.79
Serv	0.23027	0.26329	0.87
Sales	0.15829	0.26579	0.60
NRCM	0.17260	0.26275	0.66
PTMM	0.19834	0.26166	0.76
FLF***	-0.04795	0.01829	-2.62
Age55	-0.00495	0.00940	-0.53
Number of Observations		42	
Adj. R-Square		0.6994	
Root MSE		0.11356	
F Value		10.54	

Table 4: OLS Regression (without educational attainment variables), ***, **, and * represents statistical significance at the 99%, 95%, and 90% respectively

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