Eastern Illinois University

The Keep

Masters Theses   Student Theses & Publications

Spring 2022

The Impact of Immigration on Unemployment and Wages in the United States: Evidence from Seven States

Carol Ohenewa Bruce-Tagoe
Eastern Illinois University

Follow this and additional works at: https://thekeep.eiu.edu/theses

Part of the Labor Economics Commons, and the Macroeconomics Commons

---

The Impact of Immigration on Unemployment and Wages in the United States: Evidence from seven states.

Carol Ohenewa Bruce-Tagoe

cobrucetagoe@eiu.edu

ohenbi@yahoo.com

Eastern Illinois University

This thesis is submitted in partial fulfillment of the requirements for the award of a master's degree in Economics at Eastern Illinois University.

Abstract

Immigration and Immigration policies have been a source of debate for political parties in the United States, especially its impact on the labor market. This research investigates how immigration affects unemployment and wages in the U.S. by using a balanced panel dataset of seven states from 2007 to 2019. The states (California, New York, Florida, Texas, New Jersey, Illinois, and Massachusetts) sampled recorded the highest immigrant population and contain key gateway cities. I estimate two models: unemployment growth rate, and wages growth rate. The results of the pooled OLS estimation confirm that immigration has a trivial impact on the U.S. labor market. Immigrant growth shows a positive but statistically insignificant effect on the unemployment growth rate in the United States. In addition, the results reveal a positive but statistically insignificant impact of immigration on the wage growth rate in the United States. Other factors such as GDP growth and college completion show a substantial reducing effect on the unemployment growth rate. For wage growth, the study finds that college completion and unemployment growth can cause a decline, while an increase in the GDP growth rate can significantly improve wage growth. The study recommends that rather than the U.S. government targeting immigration as a way of reducing the unemployment rate, it can focus on growing its GDP and incentivizing citizens to pursue a college education. The growth in GDP will similarly help with wage growth over time all other things being equal.

Keywords: Immigration, Unemployment, Wages, GDP, Inflation, Gateway cities

Acknowledgment

I would first and foremost thank God Almighty for the enabling grace, wisdom, knowledge, and strength He provided me to conduct this research.

My sincere gratitude also goes to Dr. Linda S. Ghent for her supervision and guidance with this thesis. Her inputs contributed immensely towards the completion of this work. Additionally, I would like to thank Dr. Ali R. Moshtagh and Dr. Teshome Abebe for their willingness to serve on my thesis committee and for their invaluable contributions. I also appreciate the entire faculty of the Economics Department at Eastern Illinois University for the wealth of knowledge they transferred to me, especially in research.

Finally, I say a big thank you to my family, especially my sister Marveis Bruce-Tagoe and her husband, Mr. Godfrey Lamptey for their immense support throughout my graduate studies. I am also thankful for my friends, especially Alfred Mensah, who have supported and encouraged me throughout my academic journey. God richly bless you all.

Table of Contents

List of Tables

List of Figures

Chapter One

INTRODUCTION

1.1 Background of Study

There has been an upward trend in international migration over the years. The United Nations reports an estimate of 272 million international migrants in 2019, an increase of about 51 million since 2010 (United Nations, 2019). Several settlement countries including Canada, Austria, Australia, the UK, and the USA have immigration programs to help attract and retain highly skilled foreign workers. Amidst this growing trend in international migration, countless arguments about the foreign-born taking the jobs of natives have arisen. In the United States, immigration policy priorities have been a dividing force for the two main political parties; democrats and republicans. During the 2016 presidential campaign for example, Donald Trump, the most recent past president of the U.S. resolved to implement new immigration policies to improve the country's economy and the job market. His administration sought to restrict immigration into the U.S. through several channels, including legislation that would have sharply reduced family-based immigration. On the other hand, President Joe Biden's administration has proposed the biggest immigration policies ever, including the provision of millions of unauthorized immigrants a pathway to legal status (Krogstad & Gonzalez-Barrera, 2022).
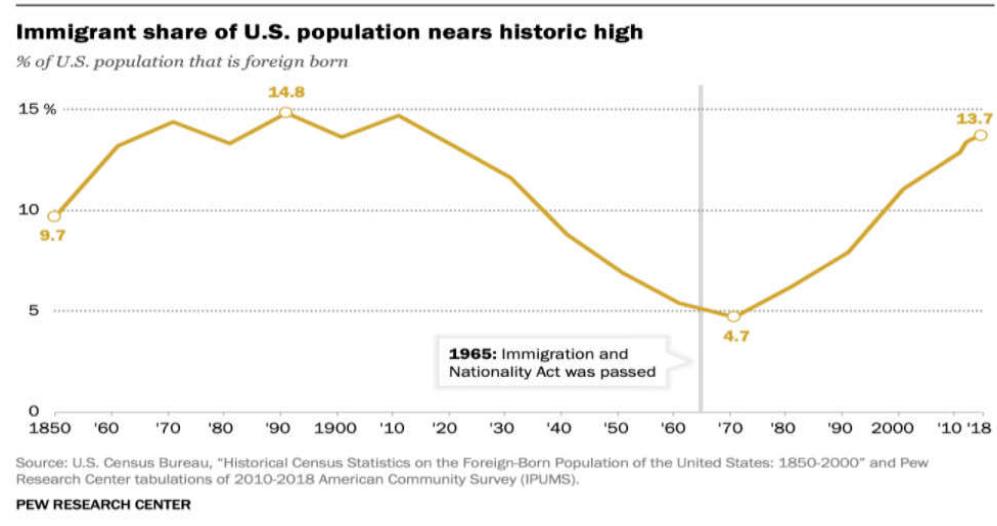
According to Islam and Khan (2015), the United States is among the countries that have espoused the most liberal immigration policies. The country currently has one-fifth of the world's migrant population, with Mexico (25% of the immigrant population) serving as one of the top origin countries, followed by China (6%) and India (6%) (Budiman, 2020). A range of 991,000 to

1.2 million immigrants were issued with new green cards between the 2013 and 2016 fiscal years, enabling immigrants to become lawful permanent residents of the United States. The year 2019 also recorded about one million immigrants becoming lawful permanent residents (Batalova, Hanna, & Leves, 2021). The highest share of immigrants in the U.S. was recorded in the 1890s, where the foreign-born accounted for 14.8% of the American population (Budiman, 2020). Currently, immigrants make up about 13.7% of the U.S. population, gradually approaching its all-time high levels (Budiman, 2020), see figure 1 below.

Immigrants often choose to reside in large metropolitan areas. Card (1990) notes that immigrants frequently migrate to cities where increased demand for labor can contain their supply. In the United States, immigrants tend to settle in gateway cities[1] within six states (namely California, Florida, Illinois, New York, New Jersey, and Texas) (Miller & Chiswick, 2004). Originally, industries that provided profitable employment and a "gateway" to the American Dream were found in these communities. Due to the increased flexibility provided by companies to enable employees to work from home in recent times, most immigrants are gradually spreading into other areas. Figure 2 displays 20 metropolitan areas in the U.S. with a high immigrant concentration. We see from the map that cities such as San Francisco, Los Angeles, Chicago, Miami, Boston, Dallas-Ft. Worth and New York City have a huge proportion of immigrant inflow.

---
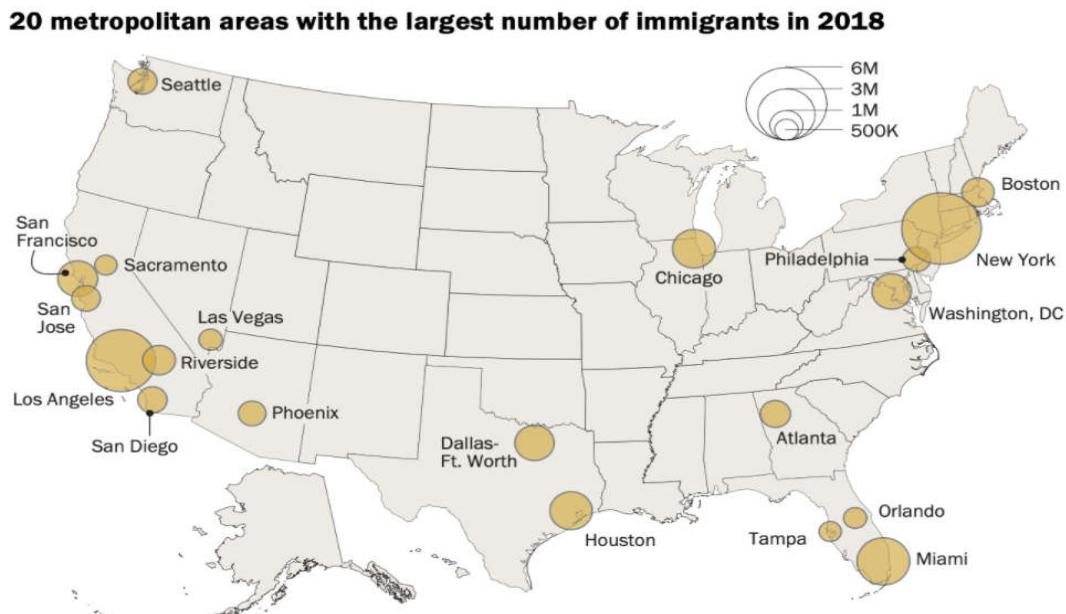
[1] A "gateway city" is used to describe an urban metropolitan area that serves as the foundation and hub for the economic industry for a state, region, or country. https://massinc.org/our-work/policy-center/gateway-cities/about-the-gateway-cities/

Figure 1:*Immigrant share of the U.S. population nears historic high*

Immigrant share of U.S. population nears historic high
% of U.S. population that is foreign born

14.8

15 %

13.7

10

9.7

5

4.7

1965: Immigration and
Nationality Act was passed

0
1850 '60 '70 '80 '90 1900 '10 '20 '30 '40 '50 '60 '70 '80 '90 2000 '10 '18

Source: U.S. Census Bureau, "Historical Census Statistics on the Foreign-Born Population of the United States: 1850-2000" and Pew Research Center tabulations of 2010-2018 American Community Survey (IPUMS).

PEW RESEARCH CENTER

Source: Pew Research Center

Figure 2: *Metropolitan Areas with the largest number of immigrants*

20 metropolitan areas with the largest number of immigrants in 2018

Source: Pew Research Center analysis of 2018 American Community Survey (1% IPUMS).

PEW RESEARCH CENTER
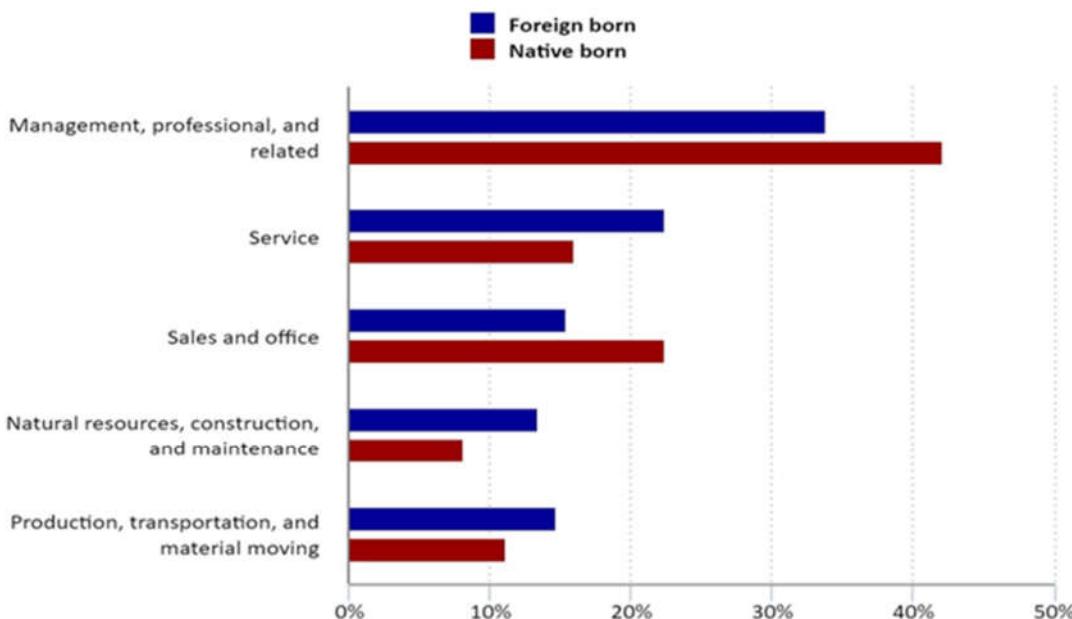
Source: Pew Research Center

In general, workers in less specialized occupations are more likely to face competition from immigrants as such jobs can be acquired with minimum skills. Dustmann, Frattini, and Preston (2013) postulate that as immigrants enter into a country, they significantly downgrade and do not immediately put their full human capital to use. They find that recent well-educated immigrants in the UK worked in lower occupation categories. Data from the U.S. Department of Labor Statistics (BLS, 2020) also show that the proportion of foreign-born workers employed in management, professional and related jobs is lower compared to native-born workers. Conversely, more immigrants relative to natives are in the service, natural resources, construction and maintenance, transportation, and production occupational sectors (see figure 3 below).

Figure 3: *Distribution of immigrants and native-born workers by occupation*

Percent distribution of foreign-born and native-born workers by occupation, 2019 annual averages

Click legend items to change data display. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

Source: U.S. Bureau of Labor Statistics

1.2 Problem Statement

Unemployment is at the heart of every country as it indicates the health of the economy. In recent years, the issue of unemployment has become a global one, a problem faced by both developing and developed countries. The sensitivity towards unemployment has increased due to its social and economic effects (Akçan and Ener, 2017). The recent past COVID pandemic saw unemployment levels in the U.S. soaring to unprecedented levels. Nationwide, the unemployment rate was 8.4% (Duffin, 2020) and 4.0% (BLS, 2022) in August 2020 and January 2022 respectively. At the state level, California and Nevada record the highest unemployment rates of 6.5% and 6.4% respectively as of January 2022 (BLS, 2022).

Although immigrants can indeed increase labor supply in certain sectors, these immigrants can at the same time influence consumer demand for goods and services and increase demand for labor. Thus, viewing immigrants as a threat to existing jobs may be a one-sided view. While some potential downsides may exist, one must not be oblivious to the positive impacts that immigrants can have on host economies. Immigrants contribute to diversity within a country and enhance productivity by pooling in different skills, ideas, and perspectives. With several allegations being made about immigrants stealing the jobs of Americans, it is worth knowing the extent to which immigrant growth influences the labor market in the United States, specifically unemployment and wages growth rate.

1.3 Research Objective/Questions

This research will investigate whether immigrant growth has any significant influence on the unemployment and wage growth rates in the United States. The specific questions this study will seek to answer are:

i.   What is the effect of immigrant growth on unemployment growth rate in the United States?

ii.   Does immigrant growth affect wages in the United States?

1.4 Significance of The Study

A review of past studies reveals that almost no known current empirical work on immigration's impact on unemployment and wages growth rate in the United States exists. This study, unlike past studies, uses the seven states with the largest share of the immigrant population. These states contain the key gateway cities where the impact of the foreign-born population on the U.S. labor market could be felt most. This work will contribute to the limited current empirical studies on immigration and the U.S. labor market. The most recent data from the 2019 Yearbook of Immigration Statistics is used.

1.5 Scope and Organization of The Study

A panel dataset of seven states (California, New York, Florida, Texas, New Jersey, Illinois, and Massachusetts) is used for this study. Data is obtained from two sources: The Federal Reserve Bank of St. Louis (FRED) and the U.S. Department of Homeland Security website. The dataset sampled for the study spans the period 2007 to 2019.

The study is divided into six chapters. Chapter two discusses the relevant literature review on immigration, unemployment, and wages. The third chapter focuses on the data and empirical methodology used. It encompasses variable description, estimation technique, and model specification. Chapter four presents a thorough description of the dataset and variables. Tools such as the correlation matrix, scatter plots, and descriptive statistics are employed. Chapter five presents the results of the panel data analysis with the necessary interpretation. Chapter six ends the study with a summary of findings, recommendations, and limitations.

Chapter Two

LITERATURE REVIEW

2.0 Introduction

This chapter reviews relevant literature on the relationship between immigration, wages, and unemployment. Theoretical literature related to international migration and how countries absorb immigrants is reviewed, followed by an empirical review of past works on the subject matter.

2.1 Theoretical Review on Immigration, Unemployment, and Wages

Several theories help to explain the driving force behind international migration. The Neoclassical economic: Macro theory is one of such. The theory stipulates that the geographic differences in the demand and supply of labor drive international migration. It explains that countries with more labor relative to capital have a low equilibrium market wage compared to countries with less labor to capital supply. The differences in wages attract labor to move from the relatively low-wage country to the high-wage country (Massey et al., 1993). Greenwood and McDowell (1986) explain that when the functions of supply and demand are more inelastic, then a migration inflow will more likely cause domestic wages to fall.

The Micro theory of individual choice is another framework that can explain why people migrate. The theory postulates that the decision to migrate is based on a cost-benefit analysis where individuals migrate if the net benefit from migration is positive. International migration is therefore viewed as a form of investment in human capital, resulting in people choosing to move to places where they can be most productive given their skills (Massey et al., 1993).

Several theoretical models shed light on how countries absorb immigrants. Hanson et al. (2005) discuss three of such theories, the first being the area-analysis model. This model assumes that the local labor market within a county is geographically segmented with no mobility among the markets. In the U.S., the states or the metropolitan areas define these markets, with each having its equilibrium wage. The model explains that the impact of immigration on wages is felt most in the communities where immigrants initially arrive or the gateway communities. New Immigrants are more willing to accept lower wages to enter the job market. Thus, the wages of natives within the gateway communities are affected when immigrants come in with similar skill sets and can perfectly substitute for the natives. Borjas (1995) posits that the effect of immigration on unemployment in the host country depends on how immigrants can substitute or complement existing workers in the receiving country. The extent to which residents are unwilling to work due to the low wages further contributes to the rising unemployment rate (Altonji and Card, 1991). Conversely, if immigrants complement natives, productivity rises as they consume more local goods, resulting in increased employment opportunities and rising wages. (Latif, 2015).

The second model Hanson et al. (2005) discuss is the Factor-Proportions-Analysis Model. Unlike the initial framework that assumes a local labor market, this model assumes that a national labor market exists. With this model, immigrants are not limited to the gateway cities and natives have the flexibility to move out of gateway communities when immigrants arrive. The pressure created on wages by immigrants is therefore disseminated beyond the gateway communities and adjusts throughout the entire national labor market.

Finally, Hanson et al. (2005) explain how immigrants are incorporated into settlement countries using the Heckscher-Ohlin (H-O) model. Although the H-O model assumes a single

national market for each factor of production, it has basic principles that can be applied to regions within the nation. The framework explains that when a country is in equilibrium, it would choose the output mix that provides the maximum national income. This output mix, which also determines the national factor prices, is constrained by national factor supplies, technology, and world product prices. How the growth in immigrants impact wages depend on the initial product mix, the magnitude of immigration shock, and the size of the country. When the initial output mix is well-diversified, wages will depend only on world prices and technology. If the immigration shock is minimal, a country can change its output mix to accommodate these shocks. This change is effected by increasing the output in the unskilled-intensive sector and decreasing that of the skilled-intensive sector. This is in line with the Rybczynski Theorem (1955), which posits that when one of two factors of production increases, there is a corresponding growth in the production of goods that use more of that factor. For a small country impacted by a small immigration shock, world prices will not change thus there will be no wage effect. In a large country (where capital is usually in abundance) however, the relative price of unskilled-intensive products will decline, resulting in a reduction in wages for the unskilled and an increase in wages for the skilled workers (Stolper-Samuelson (1941) Theorem). When there is a significantly large immigration shock, however, an economy absorbs such shocks by altering both output mix and wages irrespective of the size of the country. This is because both technology and world prices will be altered, causing a change in wages.

2.2 Empirical Review on Immigration, Unemployment, and Wages

Previous studies have provided mixed results based on the time and countries or regions being studied. A strand of work has shown a favorable immigration impact on unemployment and

wages in the host countries (see, e.g. Fromentin (2013); Boubtane et al (2013); Dustmann, Frattini, and Preston (2013); Ortega and Verdugo (2014); Kilic, Yucesan, and Ozekicioglu (2019); Chakravorty (2019)). Fromentin (2013) examines how immigration affects France's labor market and economic development using data from 1970 to 2008. By employing the Johansen cointegration analysis, the author finds a negative relationship between net immigrant inflow and unemployment. Furthermore, he establishes that past immigration has a minimal impact on wage increase in the short term. Boubtane et al. (2013) use data on OECD countries from 1987 to 2009 to show that migration significantly improves the economic prosperity of host countries. They further reveal that immigration growth correlates negatively with the aggregate, native - and foreign-born unemployment rates. Dustmann, Frattini, and Preston (2013) examine immigration's impact on the wages of native workers along with the distribution of native wages in the UK over the period 1997 to 2005. They demonstrate that immigration reduces the wages under the 20th percentile but slightly increases the wages above the 40th percentile. On average, the authors find that immigration has a modest positive effect on wages. In a similar study, Ortega and Verdugo (2014) employ the factor proportions methodology to study the French labor market and provide evidence to support a positive impact of immigration on the wages and employment of natives. They explain that the positive relationship stems partly from the imperfect substitutability of natives and immigrants in the aspect of education or experience. The authors further note that the reallocation of natives to better-paid jobs is a major reason for the positive immigration wages relationship. In the UK, Chakravorty (2019) utilizes both time-series and panel data over the period 1975 to 2006 to investigate how immigration influences employment and wages. Results from the study support the contributing effect of immigrants on GDP and the reducing impact on unemployment. Additionally, they find a significant positive effect of immigration on wages.

Chakravorty (2019) attributes the positive immigration effects to the new skills and capital that the foreign-born introduce into the country, their expenditure on consumption, contribution to entrepreneurship, the payment of taxes, and so on. In a panel study of 23 OECD countries over the period 2000 to 2015, Kilic, Yucesan, and Ozekicioglu (2019) show that migration has a negative and statistically significant effect on the unemployment rate. Manacorda, Manning, and Wadsworth (2012) assess how immigration affects the structure of male wages in Britain by using a pooled time series of data from the mid-1970s to the mid-200s. Their results suggest that immigrants and natives are imperfect substitutes, implying the increase in immigration will have a trivial effect on the wages of native-born workers. The authors posit that any significant negative impact on wages will likely be borne by resident workers who themselves are migrants.

A few studies on the other hand support an adverse immigration impact on the labor market (See e.g. Kulkolkarn and Potipiti (2007); Galloway and Jozefowicz (2008); Latif (2015)). Using provincial data over the period 2001 to 2005, Kulkolkarn and Potipiti (2007) assess how immigration affects the wages and unemployment rates of natives in Thailand. They show that immigration has no significant effect on the wages of natives. However, the authors find a substantial adverse effect on the unemployment rate, particularly the unskilled, young, and agricultural workers. In the Netherlands, Galloway and Jozefowicz (2008) find that the change in the foreign labor force in the country results in a statistically significant increase in the upward volatility of Dutch unemployment rates. In a study in Canada, Latif (2015) finds that permanent international immigration has a significant positive impact on the unemployment rate in the short-run and establishes that the unidirectional short-run causality runs from immigration to the unemployment rate. In the long run, however, this positive effect on the unemployment rate changes to become negative but statistically insignificant. The author explains that although

Canada attracts highly skilled immigrants, most employers do not accept the foreign education and experience that immigrants possess. Thus, the foreign-born are unable to secure jobs and contribute to the high unemployment rate in the short term. In the long term, however, when immigrants have obtained some Canadian education, training, or job experience the harmful impact on the unemployment rate is subsequently eradicated.

In the United States, some research works have been carried out to assess the impact of immigration on the country's labor market. Whereas some of the studies were conducted on the state level, others have been on the national front. Among the works that have recorded a positive immigration impact on the U.S Labour market include Card (1990), Bodvarsson et al. (2008), Kemeny and Cooke (2018), and so on. Card (1990) studies how the Mariel Boatlift of 1980 affects the Miami labor market. Although the Mariel immigrants increased Miami's labor force by 7%, the study results suggest that the influx did not affect the wages or unemployment rates of the less-skilled workers, including the Cubans who had immigrated there earlier. The author explains that the nature of Miami's labor market and industry structure made it well suited to absorb the influx of unskilled labor. The author also postulates that the Mariels may have displaced the natives and earlier immigrants in the Miami area. In line with the study of Card (1990), Dustmann et al. (2005) posit that how immigration affects the labor market depends on the structure of the host economy and the skill sets of the immigrants relative to the native workers. He explains that disequilibrium is likely to arise in the labor market as immigrant inflows alter the skill composition of the labor force. Bodvarsson et al. (2008) subsequently reexamined the Mariel Boatlift of 1980, measuring how immigration impacts labor demand. They provide further explanations as to why the Mariel Boatlift had an insignificant effect on the wages of natives in Miami. The authors argue that as immigrants consume goods, they create their demand. They explain that higher wages induced by

growing labor demand offset the lower wages that result from the increase in labor supply. The authors hold that the demand-augmenting effect of an immigration shock is a substantial adjustment process that must not be overlooked when evaluating the distributional impact of immigration. Bodvarsson *et al*. (2008), from their study, reveal that an immigration shock may produce three responses: the first being a substitution of immigrants for natives, the second, out-migration, and finally a stimulation of labor demand. Kemeny and Cooke (2018) employ data on 29 states obtained from the U.S. Census Bureau's LEHD Infrastructure files over the period 1991 through 2008 to investigate the effect of immigrant diversity in cities. The authors find that immigrant diversity engenders a positive and significant spillover for U.S. workers. Specifically, they find that these spillovers stem from workers who are employed in high-wage professions.

By using metropolitan area-level data from the Immigration and Naturalization Service and the Current Population Survey over the period 1994 to 2000, Orrenius and Zavodny (2007) study the relationship between immigration and wages of natives at the occupational level in the United States. Findings from their work indicate that an increase in foreign-born workers has a corresponding inverse effect on the wages of natives involved in manual labor occupations. Furthermore, the authors note that the negative outcome on the wages is often caused by immigrants who were adjusting their immigration status within the U.S. and not those recently entering the United States. For skilled native workers, however, no statistically significant negative impact on wages is found.

Ottaviano and Peri (2012) assess the effects of immigration on the wages of native U.S. workers of diverse skill levels using data over the period 1990 to 2006. They find that immigration has a modest effect (between 0.6% and +1.7%) on the wages of native workers with no high school degree and an insignificant positive impact on the average wages of natives (+0.6). The authors

however find a significant negative effect (-6.7%) on the wages of prior immigrants over the long term.

Another aspect of immigration that is of interest in the United States is how undocumented immigrants influence the U.S. economy. Winegarden and Khor (1991) analyzed the causality between undocumented immigration and unemployment of U.S. youth and minority workers using panel data for 42 states. They find no support for the commonly expressed fears of undocumented immigration causing substantial increases in joblessness among the vulnerable U.S. population. A small number of displacements is however indicated. Using data from 1994 to 2010, Schultz, Shields, and Weiler (2019) find that neither documented nor undocumented immigrants by themselves had any substantive impact on the labor force and participation rate of low-skill natives. However, the authors find that the sum of international immigrants has a relatively small impact on both participation and unemployment rates of the low-skilled native labor force.

This study contributes to the existing literature in the United States by employing more recent data to empirically investigate how immigrants in seven states (California, New York, Florida, Texas, New Jersey, Illinois, and Massachusetts) impact unemployment and wage rates. These states also contain the key gateway cities in the U.S. such as San Francisco, Los Angeles, Chicago, Miami, Boston, and New York City.

Chapter Three

DATA AND METHODOLOGY

3.0 Introduction

This section describes the data and explains the methodology employed in the study. It consists of data, variable description, estimation technique, and model specification.

3.1 Data

A balanced panel data set of seven states within the U.S. over the period 2007 to 2019 is used for this research. The states with the highest share of immigrants, based on data from the U.S. Department of Homeland Security are considered for the study. The seven states comprise California, New York, Florida, Texas, New Jersey, Illinois, and Massachusetts. The period for the study is selected based on the availability of data. Two separate models are run; unemployment and wage. For the unemployment model, the independent variables consist of *immigrant growth, college completion, real GDP, and inflation rate*. The wage model has *immigrant growth, college completion, unemployment growth rate, and real GDP* as regressors. Data for the study is obtained from two sources: The Federal Reserve Bank of St. Louis (FRED) and the U.S. Department of Homeland Security website. Except for the immigrant data that is obtained from the U.S. Department of Homeland Security, all other variables are retrieved from the FRED database.

3.2 Variable Description

i. **Unemployment Rate:** The unemployed are people of working age who are without work, are available for work, and have taken specific steps to find work (OECD, 2020). The unemployment rate is measured in the numbers of unemployed people as a percentage of the labor force. The

percentage change in unemployment rate data for all seven states is used in this study. I expect a decline in unemployment rate to drive up mean wages as fewer people are available to work, and employers are likely to increase wages to attract and retain labor. An inverse relationship between unemployment and wages is expected in this study.

ii. **Wages and Salaries:** Wages are payments made to employees for work done during a certain period. Wages are usually computed hourly and paid either once a week or once every other week in the United States. Salaries on the other hand are fixed payments, usually expressed as an annual or monthly amount, paid to employees on a biweekly or monthly basis. Most professionals and personnel in management positions receive salaries. The percentage change of the total wages and salaries in each state is used for this study.

iii. **Immigration:** An immigrant is one who lives in a country other than that of his birth. Immigration involves the movement of people into a specific country. For this study, the percentage change in the total number of persons obtaining lawful permanent resident status in the U.S. is used as a proxy for immigration. This data is obtained from the Yearbook of Immigration Statistics, available on the U.S. Department of Homeland Security's website. Migrants usually move to areas where there is a demand for jobs and better opportunities. Inferring from Borjas (1995), the extent to which immigrants complement or substitute native workers may impact unemployment levels. Furthermore, if the supply of labor (including immigrants) is more than demand, it may increase unemployment levels and cause wages to decline.

iv. **Inflation:** Inflation is the sustained increase in the general price level of goods and services. The inflation rate is measured by the annual percentage change in the consumer price index. The

Phillips curve graphs an inverse relationship between unemployment and inflation in the short run (Phillips, 1958). The Phillips curve explains that maintaining the economy at an unemployment rate lower than the natural rate can cause a rise in inflation as there is a continuous expansion of the money supply (Stirati, 2010).

v. **Real GDP growth:** Gross domestic product (GDP) is a measure of the market value of all products in an economy in terms of final goods and services. The GDP of a country is among the key factors that help determine the prosperity of a country. Okun (1962) posits that a two percent increase in real GDP results in a 1 percent decline in unemployment, signifying the unemployment-reducing effect of GDP growth. It is also expected that as an economy grows the real wages of workers increase. The real GDP growth rate, which is an inflation-adjusted indicator is used for this study.

vii. College Completion: The percentage change in the number of people with a bachelor's degree or higher for all the seven states are used to represent college completion. Generally, it is expected that people with more education will have better prospects for employment and earnings.

3.3 Estimation Technique

The study employs panel regression analysis to help understand the impact of immigration on wages and unemployment in the United States. Compared to time-series and cross-section estimations, the panel analysis provides more informative data. This technique also controls for individual heterogeneity and can capture unobservable characteristics see Baltagi (2005). The panel data regression techniques to be estimated include the: pooled ordinary least squares, fixed-effect model, and random effect model.

3.3.1 Test for Stationarity

Before running the panel regression, a unit root test is conducted to ensure that all variables are stationary. Data is non-stationary if its means and variances change over time. Nonstationary data often leads to spurious regression estimations. I employ the Im–Pesaran–Shin (IPS) unit-root test espoused by Im, Pesaran, and Shin (2003) to check for non-stationary. An advantage of the IPS test is that it allows for heterogeneous panels with serially uncorrelated errors. Additionally, it does not require panel data to be balanced before it can be used (Torres-Reyna, 2007). The study adopts the Akaike information criterion to determine the appropriate lag length to conduct the unit root test. The general IPS test model is stated as:

$$\Delta y_{it} = \emptyset_i\, y_i,\, t\text{-}1 + z_{it}\, \gamma_i + \varepsilon_{it}$$

Where Y_{it} is the dependent variable. The null hypothesis of the IPS test is that all panels contain unit root ($\emptyset_i = 0$ for all i) or the existence of non-stationarity in the panel. The panel data is stationary if $\emptyset_i$ is significantly different from zero. Im, Pesaran, and Shin (2003) allow ε_{it} to have heterogeneous variance σ_i^2 across panels. It also assumes t (time) is fixed.

3.3.2 Pooled Ordinary Least Squares Estimation

Once all variables are stationary, I conduct the pooled OLS regression analysis. This method of panel estimation pools data on different entities together based on the assumption of the non-existence of individual differences (Mućk, 2015). Pooled OLS regressions are therefore likely to suffer from heterogeneity bias. The Ordinary Least Square (OLS) technique is adopted when estimating pooled OLS regressions. The general form of panel OLS regression model is given as:

$$Y_{it} = \alpha + \beta 1 X_{it} + \mu_{it}$$

Where Yit and Xit represent the dependent and explanatory variables respectively. The individual cross-sections are represented by i, and the time, t. The intercept is α, and μit is the error term.

3.3.3 Fixed Effect Model Estimation

The rationale for the fixed effect (FE) model is that each cross-sectional unit has some unique unobserved characteristics that can bias the outcome variable, hence the need to control for it. The FE model estimation includes dummy variables to capture these omitted unobserved characteristics, making each cross-section entity (states) and period have a different intercept (Wooldridge, 2013). This model is also known as the least squares dummy variable (LSDV) as the estimation employs the OLS principle. An advantage of the FE model is that it avoids bias from omitted variables that don't change over time (such as culture) or variables that change equally over time for all entities (for example, federal laws). Conversely, the FE model has the disadvantage of having fewer degrees of freedom. Each dummy variable included results in a loss of a degree of freedom. Furthermore, no significant independent variable that varies across sectional units but not over time can be used as it will result in perfect multicollinearity (Wooldridge, 2013). The equation for the fixed effect model is generally given as:

$$Yit = αi + β1Xit + μit$$

Where Yit is the dependent variable observed for state i at time t. αi is the unknown time-invariant intercept for each entity. The time-variant regressor is Xit. β1 is the coefficient for the independent variables. Lastly, μit represents the error term. The fixed-effect model allows for correlation between αi and Xit.

3.3.4 Random Effect Model Estimation

Unlike the fixed effect model that adopts a unique intercept for each cross-sectional unit, the random effect (RE) model assumes that the intercept for each cross-sectional unit is obtained from a distribution centered around the mean intercept (Wooldridge, 2013). Each intercept is therefore random and independent of the error term for each observation. The RE model has the advantage of having more degrees of freedom than the FE model. Additionally, the RE model allows for the estimation of coefficients of independent variables that remain constant over time (time-invariant variables) such as ethnicity or gender (Torres-Reyna, 2007). A drawback for the RE model is that it assumes the omitted unobserved variables do not correlate with the independent variable to prevent omitted variable bias. The RE model uses the principle of maximum likelihood or general least squares in its estimations. The random effect model is given below:

$$Y_{it} = \alpha + \beta_1 X_{it} + \mu_i + \varepsilon_{it}$$

The RE model has two residual elements. The first consists of a combination of cross-section and time-series (ε_{it}). The second is an individual residual, which is an arbitrary characteristic of the i-th unit observation (Zulfikar & Ekonomi, 2018).

3.3.5 Choosing Between FE and RE Models

The next step will be to determine which of these three models is most appropriate for the study. The first decision is made between the fixed and random effect models. The fixed-effect model will be more appropriate when there is a correlation between the unique errors (a_i) and regressors (Xs). The Hausman test is employed to determine this. The null hypothesis for the test is that the preferred model is a random effect. The alternate hypothesis implies the fixed-effects model is preferred.

3.3.6 Choosing Between RE and Pooled OLS Models

In the situation where the Hausman test favors the random effect model, a Breusch Pagan Lagrange Multiplier (BP-LM) test is conducted to determine whether the pooled OLS or random effect is appropriate for the study. As stated earlier, the pooled OLS model assumes homogeneity, that is, state-specific characteristics are insignificant. The random effect model accounts for heterogeneity but assumes the omitted unobserved variables do not correlate with the independent variables. The null hypothesis of the BP-LM test suggests that the variance of the random effect is zero ($U_i = 0$). The acceptance of the null hypothesis thus favors the pooled OLS regression technique. For this study, accepting the null hypothesis of the BP-LM test would imply that the variation across states is insignificant. A rejection of the null hypothesis implies that the random-effect model estimation is preferred.

3.4 Model Specification

The baseline model for the study is specified below:

Model 1:

$$UNEM = f(COLL, IMM, INF, RGDP) \qquad (1)$$

The unemployment function is transformed into the generalized equation below.

$$UNEM_{it} = \beta 0 + \beta 1\ COLL_{it} + \beta 2\ IMM_{it} + \beta 3\ INF_{it} + \beta 4\ RGDP_{it} + \mu_{it}... \qquad (2)$$

Model 2:

$$WAGE = f(COLL, IMM, UNEM, RGDP) \qquad (3)$$

The wage function is transformed into the generalized equation below.

$$WAGE_{it} = \beta 0 + \beta 1\ COLL_{it} + \beta 2\ IMM_{it} + \beta 3\ UNEM_{it} + \beta 4\ RGDP_{it} + \mu_{it} \qquad (4)$$

B_0 represents the Intercept, *UNEM* is the unemployment growth rate, expressed as a percentage of the total labor force. *WAGE* is the total wages and salaries, and COLL signifies people with a bachelor's degree or higher within each state. *IMM* is Immigration, proxied by the persons obtaining lawful permanent resident status in the United States. *INF* is Inflation and *RGDP* is real gross domestic product. All variables used in the study are in percent change, representing the growth rate of the variables. U_t represents the Error term.

Chapter Four

4.0 Introduction

Chapter four summarizes the characteristics of the dataset and the relationship between variables in the study using the correlation matrix, scatter plots, descriptive statistics.

4.1 Relationship between variables

Table 1: Correlation Matrix (Unemployment)

	UNEM	COLL	IMM	INF	RGDP
UNEM	1.0000				
COLL	-0.3934	1.0000			
IMM	0.0706	-0.0409	1.0000		
INF	-0.1655	-0.0026	-0.0303	1.0000	
RGDP	-0.6842	0.3836	-0.0325	0.1590	1.0000

A correlation matrix is presented in table 1 above. Among all the independent variables, the growth rate in immigrants is the only variable with a positive correlation with the unemployment growth rate. College completion, inflation rate, and real GDP per growth rate all demonstrate a negative correlation with the unemployment rate. The real GDP growth rate shows the most negative correlation with the unemployment rate. Inflation shows the expected sign based on the Phillips curve hypothesis. Similarly, the GDP per capita rate shows the expected sign with unemployment. The correlation between all the independent variables is below 0.7, suggesting that the degree of multicollinearity between variables used in this model is relatively low.

Table 2: *Correlation Matrix (Wages)*
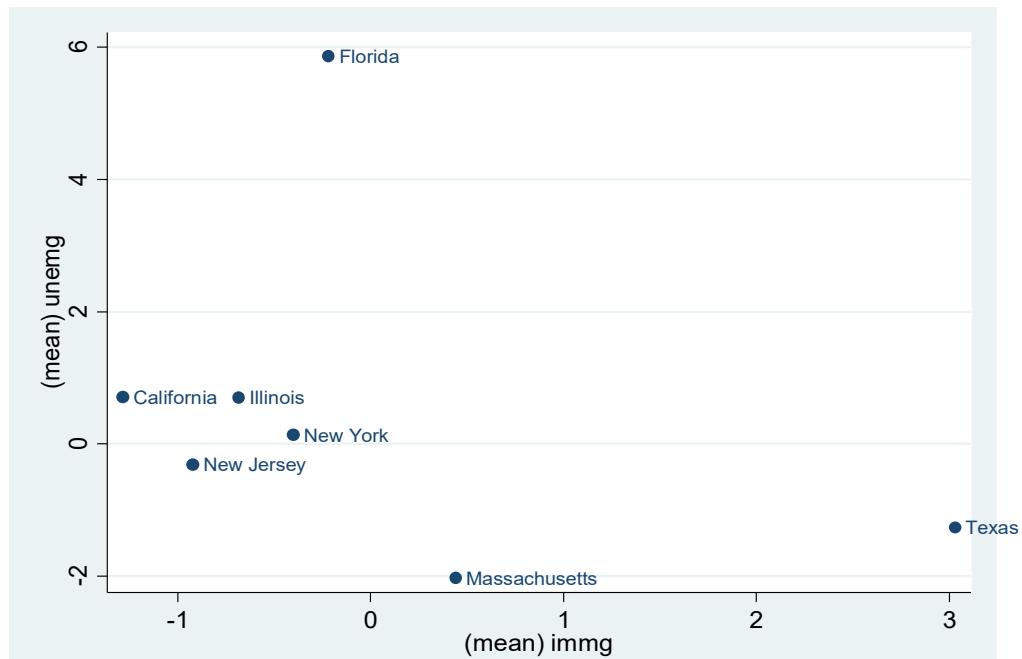
	WAGE	COLL	IMM	UNEM	RGDP
WAGE	1.0000				
COLL	0.2884	1.0000			
IMM	-0.0488	-0.0409	1.0000		
UNEM	-0.8672	-0.3934	0.0706	1.0000	
RGDP	0.7135	0.3836	-0.0325	-0.6842	1.0000

For the wages model, the growth rate in immigrants and the unemployment growth rate are the only variables that correlate negatively with the percent change in the wage variable. The percentage change in college completion and real GDP correlates positively with the wage variable. While the unemployment growth rate shows the highest negative correlation with wages, real GDP shows the highest positive correlation among the three independent variables. With the correlation between independent variables is less than 0.7, I can infer a relatively low level of multicollinearity in the model.

4.2 Unemployment, Wages, and Immigration Trend
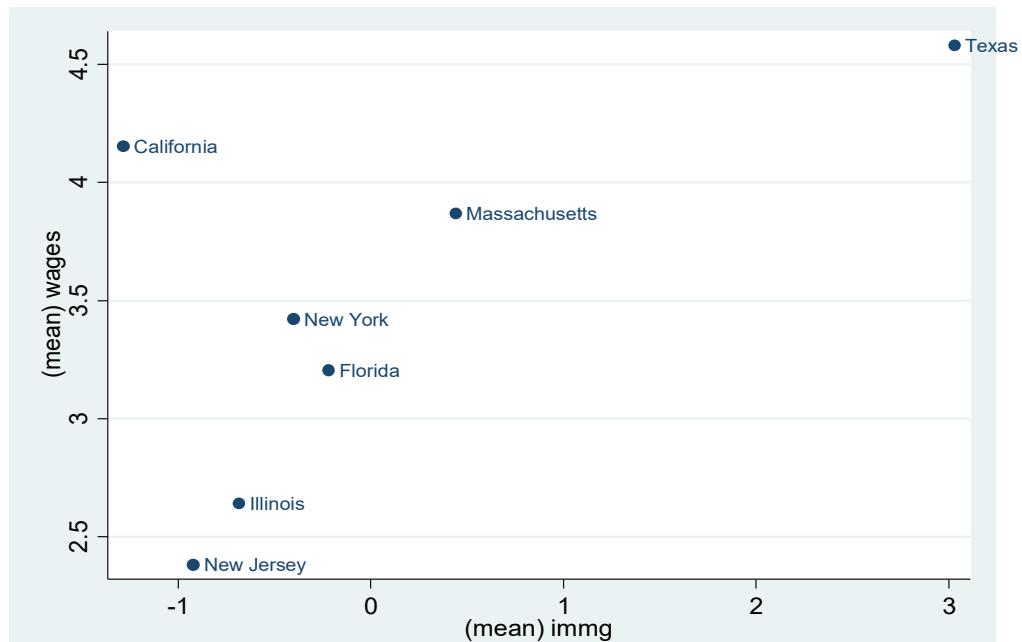
Figure 4 below displays a scatter plot of the average unemployment and immigrant growth rates for all seven states. Florida appears to have the highest mean unemployment growth rate, while Massachusetts on average records the least in the sample period. Further, California and Illinois seem to be within the same range in mean unemployment growth figures, slightly above New York and New Jersey. Averagely, Texas has the highest immigrant growth rate within the study period while California has the least.

Figure 4: *Mean Unemployment and Immigrant growth*

Source: Author's generation using Data from FRED

Figure 5: *Mean Wages and Immigrant Growth*

Source: Author's generation using Data from FRED

The scatter plot in figure 5 graphs the average wages and immigrant growth rate for all seven states. Texas has the highest in both mean immigrant and wage growth rates. Similarly, Massachusetts shows a positive mean wage growth and immigrant relationship. California has a high average growth rate in wages but the least immigrant growth rate. For wage growth, Illinois and New Jersey are at the lower end. Texas, California, and Massachusetts are however high up in mean wages. New York and Florida are mid-way in average growth in wages among the seven states.

4.3 Descriptive Statistics

Summary statistics for all variables are presented in table 3 below.

The percentage change in the unemployment rate has an average of 0.542 percent and deviates 22.071 percent from its mean. The lowest value is -21.030 percent, and it was recorded in Illinois in 2014. The highest percentage change in unemployment value is 72.470 percent recorded in Florida in 2008. The percentage change in unemployment variable for the entire dataset shows that the years 2008 and 2009 recorded the highest unemployment rates. This was during the period of the 2007-2009 financial crisis.

For the percentage change in total wages and salaries, the state of New York recorded both the highest (8.620) and the least values (-7.050). The maximum is recorded in 2007, with the least recorded in 2009. The mean percentage change in total wages and salaries value for the sample is 3.464 with a standard deviation of 3.046. In 2009, data for all the seven states reveals a negative (the lowest) percentage change in total wages and salaries.

Immigration, proxied by the percentage change in the number of persons obtaining lawful permanent resident status, averaged -0.005 percent over the period with a standard deviation of

7.444 percent. Florida had the lowest percentage change in immigrants of -15.53 percent in 2010, whereas Massachusetts records the highest value of 25.13 percent in 2016.

Table 3: Summary Statistics

Variables	Observation	Mean	Std. Dev.	Min	Max
COLL	91	1.571	1.006	-1.940	4.030
IMM	84	-0.005	7.444	-15.530	25.130
INF	91	1.949	1.135	-1.200	4.360
RGDP	91	1.642	2.112	-5.500	5.370
UNEM	91	0.542	22.071	-21.030	72.470
WAGE	91	3.464	3.046	-7.050	8.620

The inflation rate (percentage change in CPI for all urban consumers) ranges from -1.200 to 4.360 percent, which is recorded in Illinois and Florida respectively. The average inflation rate is 1.949 percent with a standard deviation of 1.135 percent.

The real GDP growth variable has a mean of 1.642 percent and deviates about 2 percent from its mean. Within the sample, the state of Texas records the maximum Real GDP growth rate of 5.370 percent in 2007. Conversely, Florida has the least growth in real GDP rate of -5.5 percent, recorded in 2009.

The percentage change in the college completion variable has a mean of 1.571 and a standard deviation of 1.006. Among the seven states, Florida records the highest percentage increase of 4.030 in 2015. The state also saw the most drop in college completion (bachelor's degree or higher) in 2019.

Chapter Five

ESTIMATION AND DISCUSSION OF RESULTS

5.0 Introduction

This chapter presents the results of the standard panel data estimation techniques. The pooled ordinary least squares (Pooled OLS), fixed effect (FE), and random effect (RE) estimations are carried out for both the unemployment and wage model. Also, diagnostic tests are conducted to ensure robust results.

5.1 Test for Stationarity Results

To ensure non-spurious results, I conduct a stationarity test on all variables using the Im-Pesaran-Shin unit-root test. The test results are provided in table 4 below. Per the results, all the variables (college completion, immigration, inflation, real GDP growth, unemployment growth rate, and wages) are stationary in their level forms. Once all the variables are stationary, I estimate the various regressions.

Table 4: *Test for Stationarity*

	Im-Pesaran-Shin unit-root test	
Variables	**Level**	**Order**
COLL	-5.9907***	I (0)
IMM	-2.9178***	I (0)
INF	-6.9374***	I (0)
RGDP	-4.4894***	I (0)
UNEM	-1.8726**	I (0)
WAGE	-3.0666 ***	I (0)

Note: *, ** and *** denote stationarity at 10%, 5% and 1% levels of significance respectively

5.2 Estimation Results

The pooled OLS, fixed - and random effect estimation outputs are displayed side-by-side for both models to help with the analysis. Because these 3 estimations are based on different assumptions, results may likely differ. I employ the Hausman and the Breusch Pagan Lagrange Multiplier tests to determine the most appropriate model to adopt for the study. As discussed in the earlier chapter, the Hausman test is first conducted to decide between the fixed and random effect models. If the fixed effect model is chosen, there will be no need to conduct the LM test. However, if the random effect is selected the LM test will be employed to decide between the pooled OLS and the RE models. All the three panel regressions are estimated using robust standard errors to ensure the robustness of study results.

5.2.1 Unemployment Model Results

The estimation results with *unemployment growth (UNEM)* as the dependent variable is presented in table 5 below. The regressors comprise *immigrant growth (IMM), college completion (COLL), real GDP (RGDP), and inflation rate (INF)*. From table 5, we observe that the pooled OLS and random effect models have similar results, although they have slightly different standard errors. Table 6 also provides the output of the Hausman test. The results of the Hausman test accept the null hypothesis of random effect. I, therefore, proceed to estimate the LM test. Results of the LM test for the unemployment model, as displayed in table 7, favor the pooled OLS estimation technique. This implies that the differences across the seven states are not significant.

Table 5: Results (Unemployment Model)

VARIABLES	(1) Pooled OLS**	(2) FE	(3) RE
COLL	-3.416**	-2.311	-3.416***
	(1.654)	(1.556)	(1.238)
IMM	0.128	0.044	0.128
	(0.207)	(0.189)	(0.135)
INF	-1.35	-2.248	-1.35
	(2.241)	(1.508)	(1.551)
RGDP	-6.440***	-7.644***	-6.440***
	(1.119)	(1.531)	(1.282)
Constant	18.65***	20.60***	18.65***
	(5.344)	(2.78)	(4.137)
Observations	84	84	84
R-squared	0.495	0.555	
Number of States	7	7	

Robust Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
PLS** Pooled Ordinary Least Squares is preferred

Table 6: Hausman Test (Unemployment Model)

Hausman Test (Unemployment Model)	
Ho	Differences in coefficients are not systematic
Chi-Squared	9.46
p-value	0.0505

Table 7: Lagrange Multiplier Test (Unemployment Model)

Breusch Pagan Lagrange Multiplier Test (Unemployment Model)	
Ho	Variance of the random effect is zero (Ui= 0)
chibar2	0.000
Prob > chibar2	1.000

The pooled OLS regression output (See table 5) shows that immigration growth and inflation have no significant influence on the unemployment growth rate in the United States. Conversely, college completion and real GDP significantly impact the unemployment rate.

Although a positive relationship between immigration growth and the unemployment rate is observed from the results, this relationship is not significant. This may be because the arrival of immigrants initially increases labor supply more than demand. However, the inconsequential effect may be explained by the U.S. labor market having a structure that can adjust to absorb the immigrant inflows over time. These adjustments may be in the form of new job creations or the expansion of existing ones. Thus, immigration's effect on the unemployment rate in the U.S. appears insignificant.

Inflation also appears to have a negative relationship with the unemployment rate in the United States, although this relationship is statistically insignificant. The negative sign is consistent with Philip's theory (Phillips, 1958).

College completion (bachelor's degree or higher) shows a negative and significant impact on the unemployment rate in the United States. Specifically, a percentage increase in the growth rate of college completion will translate into a significant decrease of 3.416 in the unemployment growth rate in the U.S., all other things held constant. The result may imply that having higher levels of education is more desirable in the American workforce. As more people are educated, they are equipped with the requisite skills for more skilled employment opportunities.

Finally, the results (see table 5) suggest an inverse and significant relationship between real GDP and the unemployment rate in the United States. The coefficient of the *RGDP* variable suggests that a one percent increase in the real GDP of the U.S. leads to a 6.440 percentage decline

in the unemployment rate. This inverse relationship is consistent with Okun (1962). When GDP is high, the economy booms and companies employ more workers, which results in a decrease in the unemployment rate. Conversely, when GDP is low, the economy slows down and companies lay off workers or reduce hiring, which increases the unemployment rate.

5.2.1 Wage Model Results

The regression results with *wages (WAGE)* as the response variable is presented in table 8 below. The independent variables for the wage model include *college completion (COLL), immigrant growth (IMM), unemployment growth rate (UNEM), and real GDP growth rate (RGDP).* The 0.0506 p-value of the Hausman test in table 9 favors the null hypothesis of random effect. The LM test (see table 10) also accepts the null hypothesis, choosing the pooled ordinary least squares estimation.

Table 8: Results (Wage Model)

VARIABLES	(1) Pooled OLS**	(2) FE	(3) RE
COLL	-0.279**	-0.217	-0.279*
	(0.132)	(0.166)	(0.166)
IMM	0.00297	-0.00366	0.00297
	(0.0228)	(0.0247)	(0.0238)
UNEM	-0.0988***	-0.109***	-0.0988***
	(0.0205)	(0.0234)	(0.0251)
RGDP	0.348*	0.174	0.348
	(0.176)	(0.206)	(0.218)
Constant	3.138***	3.331***	3.138***
	(0.372)	(0.567)	(0.543)
Observations	84	84	84
R-squared	0.787	0.805	

Number of States	7	7

Table 9: Hausman Test (Wage Model)

Hausman Test (Wages Model)	
Ho	Differences in coefficients are not systematic
Chi-Squared	9.46
p-value	0.0506

Table 10: Lagrange Multiplier (Wage Model)

Breusch Pagan Lagrange Multiplier Test (Wages Model)	
Ho	Variance of the random effect is zero (Ui= 0)
chibar2	0.000
Prob > chibar2	1.000

The results of the pooled OLS regression show that immigration growth is the only variable with no statistically significant bearing on the growth rate of wages in the United States. The other variables (college completion, unemployment, and real GDP growth rates) significantly influence the wage growth rate.

From table 8 we see a positive but statistically insignificant impact of immigration on wages in the United States. The modest positive coefficient may suggest that immigrants in the U.S. possess different skills sets and thus complement the U.S. labor force. As stated earlier, the reason for the insignificant impact may be because the country's labor structure is able to absorb the immigrant inflow. No substantial harmful impact on wages is therefore expected as immigrant inflow grows.

Although one may expect a positive relationship between college and wage growth rate, we see from table 8, that the growth in college completion rather has an inverse and statistically significant impact on wage growth rate in the United States. Specifically, a percentage increase in the completion of college education (bachelor's degree or higher) will result in a 0.279 percent decline in the wages growth rate in the U.S all other things held constant. The reason for this unexpected outcome might be because the wage variable used in this study comprises both wages of the skilled and unskilled workers, thereby making the actual impact of college-educated workers on the overall wage growth rate not so evident. Future studies may want to investigate this further by distinguishing between wages of the skilled and unskilled sectors.

The unemployment growth rate variable shows an inverse and statistically substantial effect on the wages growth rate in the United States. The variable's coefficient suggests that all things being equal a percentage increase in unemployment growth rate yields a 0.0988 % decline in wage growth rate. This outcome is statistically significant at a 1% level of significance. As the number of people available and searching for work increases, supply tends to exceed the demand and could drive down the wage growth rate. When the unemployment growth rate declines, however, it suggests that fewer people are available to work, thus employers will be inclined to increase wages to attract and retain qualified workers.

Finally, RGDP has a significant positive influence on the wages growth rate in the United States. The pooled OLS results suggest that a percentage increase in real GDP would cause wages to increase by 0.348 percentage points, ceteris paribus. As the economic pie increases due to expansion in output, each hour of work will produce more and more income over time for American workers all other things being equal.

Chapter Six

SUMMARY AND CONCLUSION

6.0 Introduction

This final chapter offers a summary and findings of the study, provides several recommendations, and the limitations of this research work.

6.1 Summary and Findings

The recent debate over immigration and immigration policies in the United States inspired me to conduct this research. Although several studies have explored the effect of immigration on the U.S. labor market, no known study has used the most recent data to empirically investigate this relationship. With the proportion of immigrants increasing over the years, this study is justified. Furthermore, by focusing on seven states (containing key gateway cities) with the highest proportion of immigrants, the study expects the true impact of immigrant growth on unemployment and wages growth rate in the U.S. to be assessed.

I investigate how immigration influences unemployment and wage growth rate in the United States, by focusing on seven states (California, New York, Florida, Texas, New Jersey, Illinois, and Massachusetts). I employ the panel data analysis, using annual data from 2007 to 2019. Except for the immigration data which is obtained from the U.S. Department of Homeland Security, all other data is retrieved from the Federal Reserve Economic Data (FRED) database. The total number of persons gaining lawful permanent resident status in the U.S. is used as a proxy for immigration. I run two different models (unemployment and wage models) to access the impact of immigration on the U.S. labor market. The Hausman test is employed to determine between the

fixed and random effect models, while the Lagrange Multiplier test is used to choose between the random and pooled OLS models. The pooled OLS model came out as the preferred model after conducting the various tests. Robust standard errors are produced for all estimations to ensure robustness.

Per the pooled OLS estimation results, immigration growth showed a positive but insignificant effect on the unemployment rate in the United States. Similarly, immigration's impact on the growth of wages in the U.S. reveals a positive but statistically insignificant effect. Study results also support a substantial inverse relationship between unemployment growth rate and college completion as well as real GDP in the United States. From the wage model we see that unemployment growth have a reducing impact on the wage growth rate in the United States. Surprisingly, the results also show that the growth in college completion impacts wage growth negatively. Conversely, the growth in real GDP increases wages growth rate all other things being equal.

Based on the study results, I conclude that the growth in immigrants has no substantial impact on the US labor market as the structure of the country's economy makes it possible to absorb immigrants through channels such as job creation and expansions.

6.2 Recommendations

Based on the results obtained from the study, the following recommendations are made for policy consideration and further research.

- Immigration policies, especially those on skilled-based immigration, should be made less stringent or more welcoming as no substantial harmful impact is imposed on the U.S. labor market.

- To curtail the unemployment growth rate, policymakers in the U.S. should shift their focus from immigration to other significant factors such as increasing GDP and incentivizing citizens to enroll in college education.

- Also, by growing the output or GDP of the country, the U.S. can stimulate wage growth over time.

- Further study may investigate the impact of immigration on the different employment and wage sectors (skilled and unskilled) within the seven high immigrant populated states in the United States.

6.3 Limitations

Although this study was a success, I encountered a few limitations. The main challenge was with state-level data availability for a balanced dataset. This made it difficult for me to disaggregate between unemployment and wage rate at the state levels. Furthermore, the unavailability of time-series data (macro-level data) on specific characteristics of immigrants - such as the level of education and skill sets - resulted in the use of aggregate immigration figures. The inability to control for such immigrant specific characteristics may therefore make my model susceptible to endogeneity issues. Known data on such characteristics were survey data.

References

Avalos, A. (2010). Migration, unemployment, and wages: The case of the California San

    Joaquin valley. *Contemporary Economic Policy*, *28*(1), 123–135.

    https://doi.org/10.1111/j.1465-7287.2009.00159.

Akçan, A. T., Ener, M. (2017). "Identification of The Macroeconomic Variables That Cause

    Unemployment: The Case of Turkey". Manisa Celal Bayar Üniversity Journal of

    Social Sciences, Vol.15, No. 4, pp. 403-426.

Altonji, J.G., Card, D. (1991). The effects of immigration on the labor market outcomes of

    less-skilled natives. Immigration, Trade, and the Labor Market. University of Chicago

    Press, pp. 201–234.

Baltagi, B. (2005). A Generalized Spatial Panel Data Model with Random Effects.

    Econometric Reviews, *32*(5–6), 650–685.

    https://doi.org/10.1080/07474938.2012.742342.

Batalova, J., Hanna, M., & Leves, C. (2021, February 11). *Migration Policy Institute*.

    Retrieved from Frequently Requested Statistics on Immigrants and Immigration in the

    United States: https://www.migrationpolicy.org/article/frequently-requested-statistics-

    immigrants-and-immigration-united-states-2020.

BLS. (2020, May). *Foreign-born workers made up 17.4 percent of labor force in 2019*.

    Retrieved from U.S. Bureau of Labor Statistics:

    https://www.bls.gov/opub/ted/2020/foreign-born-workers-made-up-17-point-4-

    percent-of-labor-force-in-2019.htm.

Bodvarsson, Ö. B., Van den Berg, H. F., & Lewer, J. J. (2008). Measuring immigration's effects on labor demand: A reexamination of the Mariel Boatlift. *Labour Economics*, *15*(4), 560–574. https://doi.org/10.1016/j.labeco.2008.04.003.

Borjas, G., 1995. The economic benefits from immigration. J. Econ. Perspect. 9 (2), 3–22

Boubtane, E., Coulibaly, D., & Rault, C. (2013). Immigration, growth, and unemployment: Panel VAR evidence from OECD countries. *Labour*, *27*(4), 399–420.

Budiman, A. (2020, August 20). *Pew Research Center*. Retrieved from Key findings about U.S. immigrants: https://www.pewresearch.org/fact-tank/2020/08/20/key-findings-about-u-s-immigrants/.

Card, D. (1990). The Impact of the Mariel Boatlift on the Miami Labor Market. *ILR Review*, *43*(2), 245–257. https://doi.org/10.1177/001979399004300205.

Chakravorty, N. N. T. (2019). How Does Immigration Impact Output, Employment, and Wages? Evidence from the United Kingdom, *19*(5), 26–55.

Chiswick, B. R., & Miller, P. W. (2021). Where Immigrants Settle in the United States. *SSRN Electronic Journal*, (1231). https://doi.org/10.2139/ssrn.574063.

Duffin, E. (2020, September 22). Statistica. Retrieved from State unemployment rate in the U.S. August 2020: https://www.statista.com/statistics/200017/state-unemployment-rate-in-the-us/.

Fromentin, V. (2013). The Relationship Between Immigration and Unemployment: The Case of France. *Economic Analysis and Policy, 43*(1), 51–66.

https://doi.org/10.1016/S0313-5926(13)50003-8.

Galloway, R. M., & Jozefowicz, J. J. (2008). The effects of immigration on regional
unemployment rates in the Netherlands. *International Advances in Economic
Research*, *14*(3), 291–302. https://doi.org/10.1007/s11294-008-9157-8.

Greenwood, Michael, and John McDowell. 1984. "The Factor Market Consequences of
U.S. Immigration." Journal of Economic Literature, Vol. 34 (December), pp. 1738-72.

Hanson, G. H., Scheve, K. F., Slaughter, M. J., & Spilimbergo, A. (2005). Immigration and
the U.S. Economy: Labor-Market Impacts, Illegal Entry, and Policy Choices. *SSRN
Electronic Journal*, (May). https://doi.org/10.2139/ssrn.296108.

Harris, J. R., and Michael P. Todaro. 1970. "Migration, unemployment, and development: A
two-sector analysis." American Economic Review 60: 126-142.

Im, K., Pesaran, H., and Y. Shin, (2003), "Testing for Unit Roots in Heterogeneous Panels,"
Journal of Econometrics 115, 53-74.

Islam, F., & Khan, S. (2015). The long-run impact of immigration on labor market in an
advanced economy: Evidence from US data. *International Journal of Social
Economics*, *42*(4), 356–367. https://doi.org/10.1108/IJSE-12-2013-0291.

Kemeny, T., & Cooke, A. (2018). Spillovers from immigrant diversity in cities. *Journal of
Economic Geography*, *18*(1), 213–245. https://doi.org/10.1093/jeg/lbx012.

Kilic, C., Yucesan, M., & Ozekicioglu, H. (2019). Relationship between migration and
unemployment: Panel Data Analysis for Selected OECD Countries. *Montenegrin*

Journal of Economics, *15*(3), 101–111. https://doi.org/10.14254/1800-5845/2019.15-3.7.

Krogstad, M. J., & Gonzalez-Barrera, A. (2022, January). *Key facts about U.S. immigration policies and Biden's proposed changes*. Retrieved from Pew Research Center: https://www.pewresearch.org/fact-tank/2022/01/11/key-facts-about-u-s-immigration-policies-and-bidens-proposed-changes/.

Kulkolkarn, K., & Potipiti, T. (2007). Migration, Wages, and Unemployment in Thailand. *Chulalongkorn Journal of Economics*, *19*(April), 1–22. Retrieved from http://www.econ.chula.ac.th/public/publication/journal/2007/cje190101.pdf.

Latif, E. (2015). The relationship between immigration and unemployment: Panel data evidence from Canada. *Economic Modelling*, *50*, 162–167. https://doi.org/10.1016/j.econmod.2015.06.013.

Manacorda, M., Manning, A., & Wadsworth, J. (2012). The impact of immigration on the structure of wages: Theory and evidence from Britain. *Journal of the European Economic Association*, *10*(1), 120–151. https://doi.org/10.1111/j.1542-4774.2011.01049.

Massey, D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. (1993). Theories of International Migration: A Review and Appraisal. *Population and Development Review, 19*(3), 431-466.

Mućk, J. (2015). Econometrics of panel data estimation. *Green Energy and Technology*,

210, 63–87. https://doi.org/10.1007/978-94-017-9953-9_5

Nkoro, E., & Uko, A. K. (2016). Autoregressive Distributed Lag (ARDL) cointegration

technique : application and interpretation. Journal of Statistical and Econometric

Methods *5*(4), 63–91.

OECD (2020), Harmonized unemployment rate (HUR) (indicator). Retrieved from

https://data.oecd.org/unemp/harmonised-unemployment-rate-hur.htm.

Okun, A.M. (1962) Potential GNP: Its Measurement and Significance, Proceedings of the

Business and Economic Statistics, 98-103.

Orrenius, P. M., & Zavodny, M. (2007). Does immigration affect wages? A look at

occupation-level evidence. *Labour Economics*, *14*(5), 757–773.

https://doi.org/10.1016/j.labeco.2006.09.006.

Ortega, J. And G. Verdugo (2014). The Impact of Immigration on the French Labour

Market Why so different? Labour Economics 29: 14-27.

Ottaviano, G. I. P., & Peri, G. (2012). Rethinking the effect of immigration on wages.

Journal of the European Economic Association, *10*(1), 152–197.

https://doi.org/10.1111/j.1542-4774.2011.01052.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis

of level relationships. Journal of applied econometrics, 16 (3), 289–326.

Phillips, A. W. (1958). The Relation Between Unemployment and the Rate of Change of

Money Wage Rates in the United Kingdom, 1861–19571. Economica, 25(100), 283–

299. https://doi.org/10.1111/j.1468-0335.1958.tb00003.

Schultz, R., Shields, M., & Weiler, S. (2019). The effects of undocumented immigration on the employment outcomes of low-skill natives in the United States. *Review of Regional Studies*, *49*(1), 99–127.

Stirati, A. (2010). Review of Political Economy Hysteresis : An alternative view Inflation, Unemployment, and Hysteresis : an alternative view. *Review of Political Economy*, *13*(December 2011), 37–41. https://doi.org/10.1080/0953825012009994.

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of econometrics*, *66*(1-2), 225-250.

Todaro, Michael P. 1969. "A model of labor migration and urban unemployment in less-developed countries." The American Economic Review 59: 138-48.

Torres-Reyna, O. (2007). Panel Data Analysis Fixed and Random Effects using Stata (v. 4.2), (December). Retrieved from http://dss.princeton.edu/training/.

United Nations. (2019, September). *The number of international migrants reaches 272 million, continuing an upward trend in all world regions, says UN*. Retrieved from United Nations Department of Economic and Social Affairs: https://www.un.org/development/desa/en/news/population/international-migrant-stock-2019.html.

Bureau of Labor Statistics. (2019, September 25). U.S. Department of Labor, *The Economics Daily*, Unemployment rates lower in five states from August 2018 to

August 2019 at https://www.bls.gov/opub/ted/2019/unemployment-rates-lower-in-five-states-from-august-2018-to-august-2019.htm.

U.S. Department of Homeland Security. (2021). *Yearbook of Immigration Statistics*. https://www.dhs.gov/immigration-statistics/yearbook:

Winegarden, C. R., & Khor, L. B. (2016). Undocumented Immigration and Unemployment of U . S. Youth and Minority Workers : Econometric Evidence Author (s): C . R . Winegarden and Lay Boon Khor Source : The Review of Economics and Statistics, Vol . 73, No. 1 (Feb ., 1991), pp. 105-112 Pub, *73*(1), 105–112.

Wooldridge J. (2013). *Introductory Econometrics*. *Introductory Econometrics*. https://doi.org/10.4324/9780203157688.

Zulfikar, R. & Ekonomi, F. (2018). Estimation Model And Selection Method Of Panel Data Regression : An Overview Of Common Effect, Fixed Effect, And Random Effect Model, (June 2018). https://doi.org/10.31227/osf.io/9qe2b.