Immigrant Migration Patterns

How Legal and Illegal Immigrants React to Changes in Economic Conditions

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Introduction

America is a country built from immigration. And, like many other migration patterns, immigration to the United States ebbs and flows. Recently, we experienced a new wave of immigration; this new influx of immigrants was the largest since the 1920s (The New York Times, 2010). According to Jeffery Passel (2011) with the Pew Center, the number of unauthorized immigrants in the United States grew rapidly through 2007. Though a downward trend in unauthorized immigrants was established in 2009, immigration is a hot-button political issue (Passel, 2011). At the center of the debate are illegal immigration and the perceived consequences illegal immigrants pose on their host communities. Many people fear that illegal immigrants will “drive down the standard of living by taking jobs from those born in this country” (Buchholz, 2007 p 63). Others argue that, as the baby-boomer generation retires, the American economy will need a larger work force to support old-age government programs such as social security and Medicare (Buchholz 2007, p 63). It is evident, then, that the arguments encompassing the immigration debate are as diverse as the people who enter this country, both legally and illegally.

The difficulty of passing immigration policy is reflected in the troubles Congress has had passing federal immigration laws. In 2007 former President G.W. Bush gave up on passing a bipartisan bill for immigration reform when faced with opposition from voters against providing a path to legal status for illegal immigrants (The New York Times, 2010). The Obama Administration, too, has struggled to pass a referendum on immigration. Additionally, initiatives to reform immigration are not limited to the federal government. Arizona recently passed the “Protect Our Law Enforcement and Safe
Neighborhoods Act” (Arizona SB 1070), perceived by liberals to be one of the harshest anti-immigration laws passed this decade, catapulting the issue of immigration into the forefront of the American consciousness. Such a negative approach towards immigrants, both legal and illegal, is not necessarily surprising. Anti-immigration hysteria is often driven by politics as well as the economy. Prior to the financial crisis and consequent recession, Arizona’s economy was very much based on growth—when that growth stopped in the early-mid 2000’s, the state was very troubled. Arizona SB 1070 can be seen as a reaction developed from a poor economy, little growth, and a uniquely conservative political culture. Nevada, for example, has seen similar changes without the same anti-immigration political reaction (J. Passel, Lecture, March 4, 2011). Arizona and Nevada are two examples of states experiencing relatively similar increase in immigration but have reacted in drastically different manners. State and regional differences in economy and politics cause immigration to be both polarizing and difficult to address.

Legal immigration is a controversial and complex issue; illegal immigration is even more so. While neither democrats nor republicans can deny that illegal immigration happens, the left and the right have very different ideas about methods for controlling the flow of immigrants into the United States. From building walls to carrying identification cards, immigration policy has proven to be a highly polarizing topic. Indeed, immigration may become a growing problem in the United States as our economy struggles to recover from the “Great Recession” while simultaneously attempting to absorb additional people. This is a problem that will exist regardless of the immigration status of the new inflow of people. Even if immigration numbers remain constant, as
they have for the past two years (Passel, 2011), we are still faced with the same problem of supporting a larger population with stagnant economy. This may be especially troubling in light of evidence that most immigrants\(^1\) who want to enter the US eventually succeed\(^2\) (J. Passel, Lecture, March 4, 2011). Yet, despite the tightening of immigration laws after 9/11 and more recent legislative attempts to curtail illegal immigration, American history as a “melting pot” and a country of immigrants has resulted in fairly relaxed immigration policy in comparison to other first world countries\(^3\).

Since 1971 approximately 25 million legal immigrants have entered the United States and almost 20% of American adults in the labor force were born outside of the country (Cadena, 2010; Jaeger, 2007). In 2010 there were approximately 11.2 million illegal immigrants (Passel, 2011). Additionally, according to estimates released in March of 2011 by the Pew Hispanic Center, 5.7% (8 million) of the American labor force and 3.7% of the American population (Passel, 2011). Additionally, the geographical shape of immigration has changed. Migrants are no longer limited to the southern-border-states (Zuniga, 2005); unauthorized migration has begun moving north. This increased geographical diversity means that opportunities for immigrants have expanded (J. Passel, Lecture, March 4, 2011).

Additionally, it is undeniable that many native citizens believe that immigration poses a cost to the host country and, specifically, the area, state, or city where the immigrant chooses to reside. Indeed, the perception of Arizona residents is that 40% of

\(^1\) From Mexico

\(^2\) Survey data derived from an unrepresentative sample from the United State and Mexico, based on self-reports. Despite these possible biases, the data suggests that people attempting to enter the US and succeeding (J. Passel, Lecture, March 4, 2011).

\(^3\) With the exception of Canadian immigration policy that is quite broad and reflected in the diversity of the country’s population. However, it should be noted that Canada’s only border is with the United States, making border crossing into Canada comparatively more difficult for Mexican immigrants.
private sector employers are working illegally. In truth, the estimate is that only 5% of workers in the state are illegal, and the Hispanic population does not top 25% (McLaren, 2006). A recent (2006) survey from the Pew Research Center for the People and the Press reported that the American public is roughly divided on the subject of the overall effect of immigration: an equal amount of people believe that immigration strengthens traditional American values as those who believe the opposite (No Consensus on Immigration, 2005). The public is also divided policy decisions for current illegal immigrants: 53% of the surveyed sample responded that illegal immigrants should be required to return to their country of origin while 40% responded that illegal immigrants should be allowed to stay. When asked about solutions to stemming the flow of illegal immigration, almost half of respondents said that increasing penalties for employers caught hiring illegal immigrants would be the best solution. One third believed that increasing the number of border patrol agents would stop illegal border crossing and almost ten percent responded positively to the continued creation of border fences. If anything, the research done by the Pew Center has shown that immigration, and illegal immigration in particular, is a subject upon which there is no public agreement (No Consensus on Immigration, 2005).

Much of the controversy surrounding immigration arises from questions about native jobs and wages. As the population of any area increases, the supply of labor increases. Without a corresponding increase in demand for labor (or some other equal change in the labor market), wages will be depressed and the city, state, or region will experience unemployment. Initial equilibrium price and quantity are P* and Q*, respectively. An increase in population (via immigration) causes supply to shift right.
The resulting equilibriums are $P'$ and $Q'$. The graph below shows a decrease in the price of labor; this translates to a decrease in wages for workers. While the quantity of labor demanded does increase ($Q' > Q^*$), the corresponding increase in population, $(Q^+)$, is larger.

The difference between $Q'$ and $Q^*$ is the difference between the quantity of labor supplied and the quantity of labor demanded if price remains constant. Demand for labor can increase to a new equilibrium only if the price of labor (wages) decreases. Increasing unemployment has serious consequences for the solvency of, and consumer confidence in, the American economy. Lower wages can also have negative consequences on the economy. Immigration represents a tradeoff for American businesses: lower wages and more workers, or higher wages and unemployment. The question for many is what the true difference between the increased labor supplied and labor demanded is; how big is
any corresponding change in labor demanded and is it large enough to offset the possible negative consequences of an increased labor supply?

Thus, the capacity of the United States to absorb legal and illegal immigrants is directly correlated with an immigrant’s ability to react to economic changes—if immigrants move to areas with existing gaps between the supply of and demand for labor, rather than in cities with maximized labor supply, the United States will be able to absorb said immigrants much more easily. Already evidence suggests that immigrant inflows respond to the economy as well as enforcement policies (Passel, 2011). Studies on the economic responsiveness of legal immigrants will serve as important indicators for the potential direction of public policy.

These implications are equally, if not more, important when applied to illegal immigration. If illegal immigrants make choices in response to changes in the American economy then the true impact of illegal immigration may be less than what assumed. Indeed, these immigrants may be filling jobs where they are needed most—potentially bolstering the American economy rather than harming it. On the other hand, if illegal immigrants are not sensitive to changes in the economic climate then the negative impact of illegal immigrants may be as serious as many perceive it to be. Non-responsive immigrants will be placing undue pressure on economies as competition for limited existing jobs increases. As such, studies of the economic responsiveness of illegal immigrants are especially important to the process of understanding the impact of immigration on the American economy.

More significantly, the current political climate makes it important to be able to understand the incentives and consequences of illegal immigration. Being able to
understand the motivations for illegal entry into the United States will be integral to crafting immigration policies that are fair, efficient, and, perhaps most importantly, enforceable. These motivations are especially important in light of the current state of the global economy; illegal immigrants are pulled to enter the United States, in part, because of the comparative economic wealth of the United States to other countries. Yet, inflows of illegal immigrants into the country also have economic consequences.

Without an understanding of the “pull” factors, policy makers in the United States will face increasingly inefficient immigration policies. Policies that do not target the reasons behind immigration (both legal and illegal) will forever be ineffective. Understanding the reactions of illegal immigrants to economic conditions will help policy makers comprehend the true impact of illegal immigrants on the overall American economy and on the wages/job opportunities of native workers. While it is true that, “selective immigration flows [may] reduce geographic earnings inequality by helping to create a national labor market” (Cadena, 2010) it may also be true that illegal immigrants’ willingness to accept illegally low wages is taking jobs away from American workers who must adhere to the minimum wages implemented by states. Before we create policies to change immigration patterns, we must first understand the economics behind the migration choices of immigrants.

My thesis aims to answer two questions that have potentially important policy implications. First, are the migration choices of illegal immigrants in the United States influenced by regional economies? And second, whether legal and illegal immigrants make different choices based on changes in economic conditions. I shed light on this question by modeling legal and illegal immigrant location choice as a function of
regional economic conditions. (Regions are defined by “field office”. See data
discussion for more detail.) My empirical study will build upon the work of David Jaeger
(Jaeger, 2007), who studied the responsiveness of legal immigrants to changes in
economic conditions, by expanding his research question to illegal immigrants.

The paper proceeds as follows: In the next section I review the relevant research
on immigration settlement patterns, highlighting differences between the choices of legal
and illegal immigration. I outline my empirical approach in section II, and discuss the
data I will use to estimate the model in section III. I present my results in section IV,
and conclude with discussion in section V.
I. Immigration Settlement Patterns and Economic Incentives

i) Motivations for Immigration

Chiswick (1988) discusses the economic incentives that influence the choice between legal and illegal immigration. The higher the cost of illegally entering the country, when compared to the proposed benefits, the less likely one is to attempt to illegally cross the border. The fact that majority of apprehended illegal immigrants in the United States are from Mexico supports this conclusion—the costs to crossing the Mexican-American border are relatively low when compared to the perceived potential benefits of migration. This cost of immigration (legal or illegal) is an important factor in the immigration decision-making process. The increase in illegal immigration, Chiswick proposes, is due to the decreased cost of immigration—lower transportation, communication, and information costs have made illegal immigration easier and more appealing (Chiswick, 1988).

Illegal immigration also has an important impact on the economic conditions of the host country. Chiswick describes the components of the host economy in a three-tiered model: 1) high skilled workers, 2) low-skilled-workers, and 3) physical capital (fixed supply). This model assumes that, “the three factors are substitutes for each other and as a first approximation the production function has a constant elasticity of substitution” (Chiswick, 1988, p. 160). Illegal immigrants, who have lower levels of education, poor English-speaking skills, and are inexperienced, generally fall into the first category of low skilled workers. As low-skilled immigrants enter the workforce, the marginal productivity of the last low-skilled worker decreases. This leads to lower wages. The presence of a legal minimum wage, moreover, will result in decreased
employment for native low skilled workers as a result of downward wage rigidity (Chiswick, 1988). Surprisingly, the influx of low skilled workers from immigration will lead to an increase in the marginal productivity of high skilled workers, leading to higher wages. In fact, Chiswick (1988) suggests that the losses from the low skilled workers are more than offset by the gains experienced by high skilled workers, leading to a native population that is better off after illegal immigration (Chiswick, 1988).

The benefits of illegal immigration are also very important factors when discussion immigration control. The ability to earn significantly higher wages in the United States comparatively to the source country must be higher than the perceived costs of migration. Even illegally low wages in the United States represent an increase from the wages given to workers in, for example, Mexico (Chiswick, 1988). Though the supply of illegal immigrants is increasing also as a result of constant, if not increasing, demand for cheap labor.

A technical report from Arizona State University suggests that a labor shortage in combination with mismatched skills serves as two of the major factors pulling illegal immigrants into the United States (McLaren, 2006). The difference between the Baby Boomers (1946-64) and subsequent generations (1965-1980) has created a labor vacuum, especially for those positions usually filled by the young and unskilled. This labor gap means that the number of unemployed workers in the United States is less than demand for labor. In addition to the labor gap, there is also a mismatch of skills for the jobs that are available. McLaren refers to this as a double coincidence of wants (McLaren, 2006, p. 2). This labor shortage in the United States also coincided with an oversupply of labor in Mexico, fueled by a population which many more young people than old. Low wages
and poor local economies are often the “push” factors for immigration while higher standards of living and higher wages are the “pull”.

**ii) Impact of Immigration on the US economy**

Borjas (1994) explores the history of American immigration policy as well as the economic considerations on both the supply and demand sides of immigration. While Borjas does not directly address the subject of *illegal* immigration, the studies that he cites do help us to understand the economic motivations of immigration in general—motivations that are present, and even perhaps accentuated, in illegal as well as legal immigrants. Borjas’s paper examines the three main questions: 1) how do immigrants perform in the host country’s economy, 2) what impact do immigrants have on the employment opportunities of natives, and 3) which immigration policy most benefits the host country (Borjas, 1994; Borjas, 2001) The answers to these questions, Borjas posits, greatly influence the architecture of future immigration policies that should aim to encourage the arrival of those immigrants who can easily assimilate to the host country, adding to the host country’s economic development. Contrarily, Borjas believes, those immigrants who will be unable to aid in the economic development of the host country should be dissuaded from attempting to enter the host country (Borjas, 1994).

Borjas (1994) further scrutinizes the studies used to examine the changes in the relative wage of the immigrant to the native worker. The results of these studies can help to explain the economic incentive of the potential immigrant to bear the initial costs of immigration. Historically, American immigration policy has greatly influenced the potential wage-outcomes of immigrants. Prior to 1965 the U.S. had very strict
immigration laws limiting immigration on the basis of national origin. Immigration visas were allocated based on the ethnic composition of the US in 1890; visas were mostly granted to immigrants from Western Europe as a result. The current increase in immigration is a direct result of the Immigration Reform Act of 1965, which repealed the national origins requirements and drastically increased the number of visas available annually (Borjas, 1994). In addition, there was a shift in the priorities of immigration policy after the 1965 reforms: off of skill-based qualifications and onto family reunification. As the populations of immigrants changed, from primarily Western European immigrants to a much more ethnically and socio-economically diverse group, the stresses placed on both source and host countries changed as well.

There is also mixed debate on the effect of illegal immigrants on the American welfare system. It is, intrinsically, difficult to determine the pressure illegal immigrants place on social services primarily because of their illegal status. The lack of data on illegal immigrants makes this very difficult to estimate. The presence of illegal aliens, however, may not be entirely negative on the host community. Illegal immigrants may contribute to the tax base of their community through several avenues. Property taxes as paid to landlords in the form of rent and sales taxes from purchases all contribute to the local economy (Borjas, 1994; McLaren, 2006, p. 3). Additionally, if the illegal immigrant is working with falsified identification (i.e. social security number) he or she will contribute to the tax base through income taxes and through social security payment (which, ultimately, they will not receive themselves). These benefits, while more easily articulated, are equally as difficult to measure as the costs of illegal immigrants.
iii) Legal and Illegal Immigrant Differences

In order to examine the differences between legal and illegal immigrants, both terms must first be defined. The United States Department of Homeland Security defines legal immigrants as “permanent resident aliens”, those immigrants to enter the United States with legitimate visas and who are inspected upon their arrival (Department of Homeland Security, 2010). As expected, illegal immigrants are those people who cross into the United States border without proper identification or those who abuse the length of a valid visa. For the purpose of this thesis, illegal immigration includes three types of undocumented residents: undocumented migrants, illegal immigrants, and illegal aliens. As defined by Bean, Edmonston, and Passel (1990) undocumented migrants are those people who enter “without documents and intends to stay only a short time and then returns home”, illegal immigrants are those who enter “as a visitor and then stays permanently” and illegal aliens are those who are “physically present in the United States and who either entered the country illegally, has not regularized his or her immigration status, or has violated his or her terms of entry” (Bean, 1990, p 11-12). Research, however, has shown that legal and illegal immigrants differ in more than their assigned definitions.

Data on legal immigrants is readily available via the DHS archives where researchers can access a broad and vast amount of data. Information about illegal immigrants, however, is much more difficult to find. The Census Bureau does not collect information on the legal status of residents and this question is also not included in the Current Population Survey or the American Community Survey (McLaren, 2006). Some
research, however, has attempted to study the difference between legal and illegal immigrants despite the lack of data.

A 1979 study by Reichert and Massey analyzed the differences between legal and illegal migration into the United States from Mexico. By examining the immigration patterns of a single town, Reichert and Massey were able to observe the migration patterns of both legal and illegal immigrants. Somewhat uniquely, the town observed in this study was comprised mostly of seasonal workers who did not remain the United States for extended periods of time. While this seasonality might have affected the outcomes of the study, the researchers still found that there are major differences between those who left the town legally and those who left illegally. Reichert and Massey found that immigration status (legal or illegal) played a major role in the determination of the size and composition of migrating parties (Reichert, 1979). Reichert and Massey found that legal and illegal migrants between the town and the United States differed in number of ways. Immigrants with legal identification (usually a green card used as a defacto work permit rather than for residence) traveled in larger groups and stayed in the United States for shorter periods of time (9 months compared to 12) (Reichert, 1979, p. 621). Expected illegals traveled in smaller groups. Most pertinent to this thesis is the fact that illegal migrants were much less mobile while in the United States and were found to travel between geographical areas much less frequently (Reichert, 1979, p. 621).

iv) Labor Market Influence on Mobility

It is important to have an understanding of where immigrants, in general, reside after arriving in the United States before discussing whether labor markets influence
immigrant mobility. A 1989 study comparing immigrants to natives of the same age and ethnicity found several important differences between the two groups. Bartel (1989) found that immigrants tend to be more geographically concentrated in cities with large ethnic populations, often in the form of ethnic enclaves, than their native counterparts (Bartel, 1989). For Bartel, however, ethnic concentration around metropolitan areas varied by educational status—the more highly educated immigrants tended to be less geographically concentrated than their less-educated counterparts. This, of course, makes sense when considering employment based visas and job placement. The more highly educated immigrants are more likely to have been sponsored by an employer, and thus, will relocate to their place of employment rather than into a large, ethnically concentrated city (Bartel, 1989). Additionally, within the immigrant cohort studied, education played a large role in migration patterns. Higher education reduced geographic concentration and the likelihood of being located in a large city. Lastly, Bartel found that internal migration within the country occurred more frequently among the immigrants than the natives (Bartel, 1989).

In general, immigrants congregate on both coasts and along the southern border. The congregation of immigrants on the coasts and border seems to suggest that immigrants are insensitive to economic changes. One might assume that, rather than moving to more central states, immigrants remain close to the coast where they entered the United States regardless of economic conditions. There is, however, actually mixed evidence regarding immigrant mobility. Dunlevy (1991) studied the settlement patterns of recent immigrants from the Caribbean and found that these immigrants tend to congregate in areas with large ethnic populations (Dunlevy, 1991). And, according to
Bartel (1989) almost all immigrants congregate in diverse metropolitan areas and are relatively insensitive to economic changes (Dunlevy, 1991; Bartel, 1989). More recent research, however, has begun showing that historically, immigrants appear to have been influenced by a combination of political and economic factors (Zuniga, 2005).

The impact of immigration is unequal: certain areas of the United States experience the benefits and consequences of immigration much more acutely than others. As one would expect, those states that border Mexico (California, Arizona, New Mexico and Texas) have historically assumed a much greater portion of the burden of immigration than others (Zuniga, 2005). A descriptive analysis of immigration patterns in the 20th century\(^4\) has shown that the economy can greatly impact the flow of immigration across the Mexican-American border as well as within the country. This study used two public policy decisions to bracket their pre-and-post descriptive analysis: before and after the Bracero Program (1942) and the passage of the Immigration Reform and Control Act of 1986 (IRCA). It is important to note that immigration patterns of Mexican immigrants are relatively representative of trends at large due to the large presence of Mexicans in the unauthorized population. Mexicans accounted for 58% of unauthorized immigrants in 2010 (Passel, 2011). These public policy decisions were both significant because of the manner in which they changed the cost-benefit balance for immigration. Prior to 1942, the United States had a period of open immigration; between 1942 and 1964 (the Bracero Era) a large temporary worker program was sponsored; the “undocumented era” between the end of the Bracero Program and the ICRA; and finally the post-ICRA period\(^5\). This

\(^4\) Specifically, Mexican-American immigration.
\(^5\) The post-ICRA period resulted in selectively militarizing the Mexican-American border.
study showed that the flow of immigration depended jointly on American policy endeavors and the economic conditions of both Mexico and the United States (Zuinga, 2005).

In the period prior to 1942, immigration flowed mainly to Texas, California, and Arizona (Zuinga, 2005, p 4) with these three states “absorbing roughly 85% of all Mexico-U.S. migrants [and] nongateway states getting just 11%” (Zuinga, 2005, p. 4). Several macro-level economic and political forces influenced Mexican immigration in the early 20th century: the integration of the Mexican and U.S. railways, the passage of xenophobic anti-immigration laws, WWI and the Great Depression. The global economic market failure during the Great Depression resulted in mass deportations and a reduction in the flow of immigrants (represented by the number of foreign-born Mexicans). The beginning of WWII and the subsequent tightening of the labor market offset the decline in immigration: the U.S. turned to Mexican labor in the face of a shrinking male labor supply (Zuinga, 2005, p. 7). The analysis shows that labor demand and immigration are positively correlated. Public policy decisions during times of growth and need for labor helped to increase the flow of immigration.

This proposition is further strengthened by the results of the analysis during the Bracero Era. The temporary worker program in conjunction with a boom in the California economy resulted in a dramatic increase in the demand for labor. Combined with an unstable economy in Mexico, Mexican-American immigration boomed alongside the

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6 Chinese Exclusion Act (1880s) and Gentlemen’s Agreement of 1907
California economy (Zuinga, 2005, p. 7). The passage of IRCA\(^7\) resulted in a labor market flooded with newly legalized immigrants. Legalization gave immigrants new opportunities to travel in search of gainful employment. Deteriorating economic conditions in California (which had been the cornerstone of Mexican-American immigration prior to the passage of IRCA) as well as an economic crisis in Mexico provided immigrants with the economic inventive to move with their newly granted legal status. For the first time immigrants and the right to and incentive to travel to non-traditional states (Zuinga, 2005). “In just a decade, the percentage of Mexican immigrants located in California dropped 10 points—from 58 percent to 48 percent. At the same time, in Texas it continued to fall, reaching an all-time low of 19 percent in 2000” (Zuinga, 2005, p 13). The 1990s saw an increase in the diversity of destinations with “new centers of attraction…emerging in Florida, Idaho, Nevada, New York-New Jersey, North Carolina, and elsewhere” (Zuinga, 2005, p 13). Thus, descriptive analysis of immigration patterns show that immigrants continue to move to nontraditional states in the wake of continually changing economic and political changes.

The effect of economic changes on immigration patterns can also be observed in empirical studies: Jaeger (2007) showed that changing economic conditions influence immigrant migration. Jaeger (2007) is unique because of the data used—he compiled data from the old INS and the current DHS enabling him to have a relatively accurate data set of almost *all* of the legal immigrants into the United States from 1971 until 2000 (Jaeger, 2007). This provides Jaeger with the opportunity to examine changes over a large period

\(^7\) IRCA provided general amnesty and included a special legalization program for farm workers. According to Zuinka (2005), approximately 2.3 million Mexicans acquired legal documentation between 1987 and 1990 (p 11).
of time with a large and comparatively accurate sample. Jaeger used unemployment and expected wages to measure the quality of the economy in question. By dividing legal immigrants into seven specific categories based on visa status (immediate family of US citizens, no quota; family of citizens subject to quota, family of legal permanent residents, employment-based visa, diversity visas, refugees/asylum, vestigial category of entrants from Western Hemisphere) and comparing the time series data on legal immigrants, Jaeger found that immigrants are generally responsive to changes in labor market conditions (Jaeger, 2007). This division by visa status allowed Jaeger to disaggregate potential confounding factors between the different visa groups. Those immigrants who enter the country on an academic visa may be inherently different from those who are on employment-based visas.

The study concluded that legal immigrants tend to congregate in areas with higher wages and lower rates of unemployment and that this tendency is observed more in males with employment-based visas. This conclusion, however, is not entirely surprising as employment-based visas are sponsored by employers and thus, these visas are likely to be concentrated around areas where there is a dearth of native talent/labor supply (Jaeger, 2007).

Cadena (2010) corroborates Jaeger’s findings. While Jaeger’s study used long term data sets regarding legal immigrants and unemployment rates, Cadena uses specific, and differently sized, labor market shocks that affected both employment probability and future wages to estimate the impact of host country competition and immigrant flows (Cadena, 2010; Jaeger, 2007). Specifically Cadena studies the changes to the Aid to Families with Dependent Children (AFDC) program in the 1990s that altered the
employment rate among low-skilled workers. As a result of the changes to welfare, the employment rate among low-skilled workers, especially females, was drastically affected (Cadena, 2010). Additionally, Cadena’s choice to focus his study around the 1990 welfare reform acts is unique because of the fact that the impact of the reform was not uniform around the country; increases in female employment was principally the function of the size of the population affected by the policy changes (Cadena, 2010).

Moreover, the similarities in the labor choices of the women entering the workforce as a result of welfare reform and low skilled, newly arrived immigrants provide an ideal comparison and means of evaluating immigrant location decisions. Any increase in the native labor supply is viewed as a comparative increase in the overall supply of labor as the number of people searching for a single job vacancy increases (Cadena, 2010). Through this analysis Cadena concludes that low-skilled immigrants are, indeed, quite sensitive to changes in the labor market and that immigrants function as labor market arbitrageurs, “differentially selecting areas with better employment prospects” (Cadena, 2010, p. 10).

The eminent papers on immigration have shown that immigrants are motivated by a variety of factors ranging from familial to economic. For illegal immigrants, especially, there are significant costs associated with entering the United States. One must assume that the perceived benefits of immigration outweigh the tangible costs borne by immigrants. Immigrants of both types impact their surrounding local economies. Illegal immigrants (who are usually less educated, have limited language skills, and are classified as low-skilled workers) can especially have a negative impact if a local economy is unable to properly absorb them. However, the lack of precise data on illegal
immigrants makes it difficult to accurately estimate the true impact of an illegal immigrant on the economy. In this same vein, it can also be difficult to gather data on the locations of illegal immigrants. In general, however, immigrants tend to congregate on the two coasts in highly ethnically concentrated areas. More highly educated immigrants tend to be more highly dispersed.

There has, specifically, been some research on patterns of immigrant migration and the economy. Previous findings, however, tend to focus on the migration patterns of legal rather than illegal immigrants. Current research shows that there are differing opinions on whether or not immigrants react to changes in local economics. Separate studies by Jaeger (2007) and Cadena (2010), however, have used data to show that legal immigrants make choices based on economic conditions. There is a distinct lack of research on the migration patterns of illegal immigrants. This study aims to fill this gap in the research.
II. Empirical Approach

Previous research by Cadena and Jaeger has shown that, in many cases, legal immigrant’s location decisions are influenced by local economic conditions (Cadena, 2010; Jaeger, 2007). These studies, however, fail to address the question of whether or not illegal immigrants are also sensitive to changes in economic conditions when making location decisions. Beyond that initial question, even less is known about any potential differences between the reactions of legal and illegal immigrants to these economic changes.

To answer these questions I will use a simple fixed effects model:

\[ \text{imm}_{itj} = \alpha_i + \theta_t + \beta_1 S_j + \beta_2 \text{EC}_{it} + \beta_3 (\text{EC}_{it} \ast S_j) + \epsilon_{itj} \]

where \( \text{imm}_{itj} \) is the natural log of the number of immigrants of legal status \( j \) in region \( i \) in year \( t \) scaled by population: percentage of immigrants in a given region. Legal status is either legal (\( S_j=1 \)) or illegal (\( S_j=0 \)), \( \text{EC}_{it} \) is a vector of economic condition measured by field office (i)\(^8\) and year (t). I measure a selection of economic factors including: unemployment insurance benefits, average earnings per job, jobs per worker, percentage of farm proprietors, farm acreage, and farm proprietors’ income. The third term represents an interaction between immigration status and economic condition. The estimated value of \( \beta_3 \) will represent the extent to which the migration patterns of legal and illegal immigrants are differentially affected by economic conditions.

The studies from Cadena and Jaeger (Cadena, 2010; Jaeger, 2007) suggest that, when considering the first term, \( S_j \), legal immigrants will be responsive to changes in local economic conditions and \( \beta_1 \) will not equal 0. Less information is available to make

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\(^8\) Field offices are defined by the Department of Homeland Security, see section III. Data.
a prediction regarding the value of $\beta_1$ and illegal immigrants. The third term is integral for answering the question of whether or not there is a difference between the reaction patterns of illegal and legal immigrants where:

\[
H_0: \beta_3 = 0 \\
H_A: \beta_3 \neq 0
\]

If I fail to reject the null hypothesis, $H_0: \beta_3 = 0$, then there will be no observable difference between the reaction patterns of legal and illegal immigrants to changes in local economies. If, however, the null hypothesis is rejected, then there will be a statistically significant, observable, difference between the location patterns of legal and illegal immigrants. However, because there are no priors for the interaction term, rejecting the null hypothesis will only show that there is a difference between the legal and illegal cohorts.

Using fixed effects in the model is an important step for eliminating observed confounding factors that may be inherent in the data (Angrist and Pischke, 2009); any time-invariant differences across states in immigration and economic conditions will be accounted for by the state fixed effects $\alpha_i$ and any temporal shocks common to all states will be differenced out with the year fixed effects $\theta_t$. I allow for arbitrary correlation in the unobserved component of immigration $\epsilon_{it}$ within field offices by clustering at the field office level.

I choose to integrate legal and illegal immigrants into the same equation rather than estimating them separately. This is because in order to compare coefficient estimates across models, one must assume that legal workers and illegal workers in the labor force are completely independent of each other—that illegal immigrants only
participate in the illegal, underground economy and legal immigrants only participate in the legal economy. This is not an assumption that we can make about American immigrants.
III. DATA

Three sources of data will be used for the analysis in this study: 1) the Department of Homeland Security (DHS), Yearbook of Immigration Statistics 2) U.S. Bureau of Economic Analysis (BEA) and 3) the United States Department of Agriculture (USDA). I will be creating a secondary data set using these sources of primary data.

In order to create this unique data set, I will be aggregating two specific tables from the DHS, “Aliens Expelled by Region and Field Office” and “Legal Entries by State of Intended Destination”. The DHS data on “Aliens Expelled by Region and Field Office” provides data on the number of illegal aliens apprehended and deported (either voluntarily or forcefully) by the DHS by office and region as follows. Eastern Region: Atlanta, Baltimore, Boston, Buffalo, Cleveland, Detroit, Miami, New Orleans, New York, Newark, Philadelphia, Portland, Washington⁹. Central Region: Chicago, Dallas, Denver, El Paso, Harlingen, Helena, Houston, Kansas City (MO), Omaha, St. Paul, San Antonio Western Region: Anchorage, Honolulu, Los Angeles, Phoenix, Portland, San Diego, San Francisco, and Seattle (Department of Homeland Security, 2010).

The second table that will be under consideration for this study reports the number of legal immigrants who enter the US and their intended state of residence. In order to enable comparison between “Aliens Expelled” and “Legal…Intended State of Residence” I will be using the regions (jurisdictions as determined by the DHS field offices) as my unit of analysis. States without field offices that have data on expelled aliens will not be individually used for my analysis; instead, absent states will be aggregated into the jurisdiction as determined by field office (region). One of the

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⁹ Data is also included on those immigrants who were apprehended and expelled (formally or voluntarily) in San Juan, PR. Data for this city will be not be included in this study.
important reasons for using states as the unit of analysis is because state boundaries have not changed during my period of analysis. The definition of cities and the boundaries of cities have changed over time. Thus, using states rather than cities will provide constant boundaries for my analysis rather than nebulous metropolitan areas. Additionally, because the data for expelled aliens is provided in terms of regions, it is important to use state data when aggregating into regions in order to provide consistency over the time period.

The BEA will provide the data necessary to estimate the economic condition of the states. Specifically, my dataset will use BEA data for population, number of jobs (aggregated full-time and part-time), and average yearly wage per job. I use BEA data to create a statistic for economic status rather than using the unemployment rate more commonly used in the media. I choose to do this because the government unemployment rate does not include discouraged workers and thus, may not be a truly accurate estimator of economic conditions. Hypothetically, the government provided estimation for unemployment might grossly underestimate the true economic condition of a state or region. If a large portion of the population is considered to be “discouraged” rather than “looking for work”, then the government estimation for unemployment will not include these people—inflating, and positively biasing, the resulting statistic. In reality, a vector created by comparing the regional population to the total number of jobs in the region will more accurately reflect the economy in question.

Though this study will not be using the government provided estimate on unemployment, the BEA does provide data on “unemployment benefits per capita”. This includes state and federal unemployment benefits as well as unemployment for railroad
employees and veterans. Though this is provided per-capita (eventually scaled up for the
data set), it is an important indicator for poverty and the economic condition of the area
in question. “Unemployment benefits per capita” do not include transfer payments
(Medicare/Medicaid, disability insurance benefits, etc). For a more detailed list of
variables used in this study, please consult section VII: Definitions. The BEA data is
provided by state and year\textsuperscript{10}. The 2003 reorganization of the INS into the DHS resulted
in a change in the location and number of field offices. Because of this change, I only
use pre-2003 data in order to maintain the integrity of the dataset. The range of years for
this study is 1983-2002.

Data from the USDA are used to estimate the presence of the agriculture industry
within a given DHS field office’s jurisdiction. This serves as a supplemental estimation
of agro-business as BEA data on farms and farming do not include figures from corporate
farms. Hypothetically, acreage serves as a more accurate measure because it should
include all lands used to produce crops. I will specifically be using data on the amount of
land (given in acres) devoted to growing principal crops. The USDA presents this data
by state and year. Important to note, however, is the fact that the USDA only publically
provides data on agricultural acreage until 1993. For this reason, a separate analysis of
farm acreage will be run including the years 1993-2002.

There are concerns regarding the use of DHS data on illegal immigrants (the data
on legal immigrants is considered to be fairly reliable). MacKenzie, Baunach and Roberg
address similar concerns in Measuring Crime: Long-Scale, Long-Range Efforts (1990).
Though this book is specifically in regard to the FBI’s Uniform Crime Reports, both the
UCR and DHS data share similar flaws. Many of these flaws are direct consequences of

\textsuperscript{10} For a full list of variables, as well as descriptions of each, see Appendix A.
the very nature of the subjects being studied. The data inherently lacks precision because only those criminals who are caught are included in the report (this is true for both the UCR and DHS data) (Mackenzie, 1990).

There is also some concern in regard to the use of archival data for secondary analysis of criminal justice issues. Both the BEA and DHS data used in this study are archival data. Inherent in the use of archival data for analysis is a disadvantage in regard to understanding and conceptualizing the original research design. “The successful use of archival data will therefore, be constrained by the degree to which documentation can provide important, if vicarious links between secondary analysts and the principal investigator(s)” (MacKenzie, 1990, p. 145).

In addition to concerns about the use of archival data for secondary analysis is the practice of data collection from the DHS. Every year, the DHS submits and publishes the *Yearbook of Immigration Statistics*, from which a significant portion of my data hails. As discussed previously the data on illegal immigrants is organized by “field offices”. Field offices vary in size and location—some states have no field offices while others have many. As is expected, those states that see the most immigrant crossings are the states with more field offices. Data on historical jurisdictions of field offices is not available from either Immigration and Customs Enforcement (ICE) or DHS. Repeated calls and correspondence with the DHS/ICE revealed no information regarding field office jurisdictions. ICE/DHS only publically provides data on the current, 2010, jurisdictions for field offices. Because of this lack of data, the jurisdictions and regions used in this analysis are estimates constructed from the available current information.
The estimations for historical jurisdictions were based on the current jurisdictions and geography. The restructuring of INS into DHS resulted in only a few changes to the physical locations for field offices. Several offices were removed after reorganization. Only current office, Salt Lake City, was not present prior to 2003. Comparisons between the current jurisdictions and the historical offices were made in order to determine estimated jurisdictions for the historical offices. For example, prior to 2003 there were offices in both Michigan (Detroit) and Ohio (Cleveland). Ohio is included as part of the Detroit office’s current jurisdiction. It can be concluded that prior to 2003 Ohio was under the jurisdiction of its own office (Cleveland) as was Michigan (Detroit). In several cases jurisdictions pre- and post-2003 remained constant. In most cases, these included states with single state jurisdictions such as Florida. States without offices that are located relatively closer to historical offices than their present jurisdictional offices were assigned to the historic office. Because of this organization, the data set is organized by region (as determined by field office) rather than state.

Preliminary results show that field offices fall into three different categories: those offices where legal immigration outpaces illegal immigration, those offices where illegal immigration outpaces legal immigration, and those offices where (sometime during 1983-2003) illegal and legal immigration intersect at one or more points. Unsurprisingly, more states fall into the first category than the second. Only for two states, Arizona and Texas, do we see consistently higher rates of illegal immigration than legal immigration (see Figures 1 and 2). In both states we observe marked differences between the numbers of legal and illegal immigrants.
Four field offices\textsuperscript{11} fall into the third category where legal and illegal immigrants intersect at one or more points during the 19-years in question: Montana, Maine, Nebraska and California. Comparatively, Montana, Maine and Nebraska have markedly lower numbers than California. This is not unexpected. Additionally, California also falls into the first category for the majority of the years examined—only for a short time in the early 1990’s does legal immigration outstrip illegal. The intersection for Nebraska was caused by a drastic increase in immigration between 1995 and 2003. Similarly, Maine saw both an increase in illegal immigration and a decrease in legal immigration. During the late 1980s, illegal immigration to Montana dropped dramatically as legal immigration remained relatively constant (except for a small spike in the early 1990s). Prior to the decline in illegal immigration for Montana, however, illegal immigrants far outnumbered legal. The final observed trend is also the most common. For the eighteen remaining regions\textsuperscript{12}, legal immigrants outnumber their illegal counterparts. The observed trend is also the expected trend for many of these regions\textsuperscript{13}.

While illegal and legal immigration for individual regions can differ greatly, in general, the data confirms that hypothesis that immigration to the United States has increased since 1983. For most regions (and thus, states) illegal immigrants are, comparatively, much lower in number than legal immigrants. For some states, specifically those that share a border with Mexico, the opposite is true. In these regions, illegal comprise a much larger portion of the immigrant population than legal.

\textsuperscript{11} Please refer to section VIII: Graphs.
\textsuperscript{12} Massachusetts, New Jersey, Minnesota, Missouri, Louisiana, Maryland, District of Columbia, Colorado, Florida, Illinois, Georgia, Washington, Alaska, Ohio, New York, Oregon, Michigan, Pennsylvania
\textsuperscript{13} Remember, the field offices are an aggregation of, in many cases, several states. This means that jurisdictions of the Arizona and Texas field offices contain most of the southern-border states. Thus the two regions in category 1 (illegal>legal) actually comprise of more than the two states for which the regions are named.
IV. Results

Table 1 displays my estimate of the relationship between economic conditions and migration patterns. In column (1), I set EC=jobs per worker, where

$$\text{jobs per worker} = \frac{\text{total full time and part time jobs}}{\text{population}}$$

and the interactive term was set to (Sj*jobs per worker)$^{14}$:

Immigrants are responsive to changes in jobs per worker, $\beta_2=0.418$. This denotes a positive correlation between jobs per worker and number of immigrants—regions with higher jobs per workers see higher rates of immigration. This regression also shows that legal immigrants are slightly more responsive than illegal immigrants, $\beta_3=0.264$ (See Table 1, column 1). None of the coefficients were found to be statistically significant in this regression. The coefficient for “jobs per worker” supports the findings of both Jaeger (2007) and Cadena (2010) as both researchers concluded that immigrants are responsive to changes in labor market conditions. This is especially important considering that this study builds off of the work of Jaeger. The results showing that legal immigrants are more responsive than illegal immigrants to changes in jobs per worker are also supported by previous research by Jaeger and Cadena whose research only addressed legal immigrants.

The second regression compared the responsiveness immigrants to changes in unemployment insurance benefits: Unemployment insurance benefits are used as a measure of unemployment in a given region—the higher the benefit disbursement than, it is assumed, the higher the rate of unemployment. Where the previous regression measured jobs per worker by literally taking a percentage, this variable serves as a proxy

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$^{14}$ The population term is provided by the U.S. Census and, therefore, includes all people in a given region. This term is not limited to only those people over a certain age.
for unemployment that may be more accurate than the government provided unemployment statistics. The regression showed that immigrants are also responsive to changes in unemployment insurance benefits payments, $\beta_2=-0.0277$ (See Table 2, column 2). Immigration is negatively correlated with changes in unemployment insurance benefits. With $p=.001$ this is statistically significant though the effect of changing unemployment insurance benefits is minute. Once again, $\beta_3$ is positive, suggesting that legal immigrants are more responsive to said changes than illegal immigrants. In this regression, however, the coefficient for $\beta_3$, while positive, is very small ($\beta_3=0.0335$) (See Table 2, column 2). This suggests that while there may be a difference between the reactions of legal and illegal immigrants to changes in economic conditions, this difference is not very large. Conceptually, this result makes sense—if immigrants are responsive to labor market changes, and make mobility decisions based on this information, then immigrants should be less likely to move to areas with high unemployment payments. Cadena’s assertion that low-skilled immigrants are “labor market arbitrageurs differentially [selecting] areas with better employment prospects” (Cadena, 2010, p. 10) is supported by this result.

Economic factors are not limited to employment-based variables. Using “average earnings/job” helps to estimate the quality of a regional economy in a more quantitative manner (those regions with higher average earnings/job have heartier and more robust economies). Thus the regression models the responsiveness of immigrants to changes in earnings per job as well as whether legal and illegal immigrants respond differently. In the natural log regression, the coefficient for $\beta_2=-0.308$, suggesting that higher average earnings per job in a region results in lower rates of immigration (Table 2, column 3).
This finding is surprising. Conventional thought would insinuate that immigrants, if they were responsive to economic changes, would travel to the regions where wages are highest. Upon closer examination, however, this finding might not be counterintuitive. Immigrants are highly bifurcated into high-skilled and low-skilled workers (those immigrants who have education and those who do not). Areas that have very high average earnings may not be conducive to immigrant populations; high wage jobs often require higher levels of education and skill. These results are also consistent with the theory that immigrants drive down wages. Thus, the areas with higher wages would be those with fewer immigrants. A positive $\beta_3$ supports the initial hypothesis that illegal and legal immigrants react differently to changes in economic conditions. Legal immigrants may be more likely to have access to employment with higher wages and are, thus, more likely to respond to increases in average wages than illegal immigrants (who may be more willing to accept illegally low wages).

Immigrants are often perceived to participate in the agricultural industry because it provides seasonal employment and has very little oversight. As such, I also estimated immigrant responsiveness to changes in the percentage of farm proprietors where

$$%farm = \frac{\text{number of farm proprietors}}{\text{total number of proprietors}}.$$  

The regression had surprising results with $\beta_2 = -0.716^{**}$ (See Table 2 column 4). The negative sign of the coefficient suggests a negative correlation between the percentage of farm proprietors and immigration; there are fewer immigrants in regions with higher percentages of farm proprietors. This is surprising given the perception that low-skilled immigrants are driven to seasonal agricultural work. Of course, it is important to consider the limitations of the data provided by the BEA. As discussed previously, $\%farm$ is obtained by dividing the number of farm proprietors by
the total number of proprietors. The definition of proprietors is especially important here. The BEA does not include corporate farms—thus the term “proprietors” refers to smaller and family owned farms. This may be why the coefficient is negative—the variable itself is not an accurate measure of the agricultural industry in a given region. The large, corporate farms are much more likely to hire illegal immigrants than the small, family-owned farm. Thus, this regression does not capture the effect of large corporate farms on immigration. What $\beta_2$ shows, then, is that immigrants are not responsive to increases in non-corporate farms, in fact there are fewer immigrants in areas where there are more sole-proprietorship and partnership farms. The counterintuitive quality of this result perhaps suggests that corporate farms, rather than private farms, may be a driving force behind immigrant mobility decisions. This hypothesis is discussed in the next paragraph.

The coefficient for the interactive term $\beta_3=.0423$ is positive. This means that, once again, illegal immigrants are slightly less responsive than legal immigrants. This may also be explained by the differences between the employment prospects of legal and illegal immigrants. Smaller farms may only be able to hire legal immigrants—the risks associated with being fined for hiring illegal labor may be too high for smaller proprietors. Large corporate farms (like the ones that supply poultry for Tyson, etc) are better able to absorb the costs related to fines for hiring illegal labor. Thus, legal immigrants would be more responsive to changes in the percentage of non-corporate farms while the opposite may be true for illegal.

In order to discern the differences between corporate and non-corporate farms and their respective effect on immigrant decisions, a different variable should be used—one that more effectively captures the size of the agriculture industry in a given region. Thus,
a more accurate measure of agriculture’s effect on immigration is to measure the amount of land devoted to farming in a given region. Measuring the presence of the farming industry in this way allows the inclusion of farms of many sizes, especially important is the inclusion of corporate farms. This data is provided by the United States Department of Agriculture and is reported as acres used for growing principal crops. Unlike the rest of the data used in this analysis, numbers on farm acreage is only available until 1993. Thus, the range of year for analysis on farm acres is 1993-2002. \( \beta_2 = 0.0118 \) and \( \beta_3 = -0.0000169 \) (See Table 3, column 1). Unlike the previous regression, here, \( \beta_2 \) is positive. This reflects a positive correlation between immigration and the number of acres devoted to farming in a given region. The difference between the previous regression, where EC=\%farm and this one where EC=farm acreage, supports the theory that it is corporate-sized farming, rather than smaller proprietors, that partially influence immigration. Scale is very important to consider when discussing the magnitude of \( \beta_2 \). Though the relationship between \textit{farmacres} and immigration is positive, acres in this equation is scaled down by 1,000,000. This means that the 1-unit change in \textit{farmacres} required to increase immigration by 13% is actually equal to 1,000,000 acres of land. The differences between the models excluding and including corporate farms do reflect that immigration is influenced by the presence of agro-business and, perhaps, that the presence of agriculture in general influences immigration. Also consistent with this idea of agro-business is the fact that \( \beta_3 \) is negative. This suggests that illegal immigrants are more responsive than legal immigrants. If corporate farms are more likely to hire illegal immigrants (which means that the corporation is not constrained to minimum wage laws and thus lowers costs and increases profits), then it would make sense that illegal immigration...
immigrants would be more highly influenced by changes in the presence of agro-
business.

Setting EC=farm proprietors’ income estimates the responsiveness of immigrants
to the economic power of the agricultural industry. Those regions that have higher farm
proprietors’ income have a healthier agricultural economy that, in turn, may attract more
immigrants. For the regression $\beta_2=0.152$ and $\beta_3=-0.221$ (See Table 2, column 5). These
coefficients are very small both suggesting very minute relationships between immigrants
and farm proprietors’ income. In this equation, $\beta_3$ is negative. This implies that illegal
immigrants are more responsive to changes in farm proprietors’ income than legal
immigrants. This is, perhaps, explained by the fact that, on average, legal immigrants are
more likely to be more highly skilled and educated and thus, may be less likely to make
choices based on sectors of the economy with which they have very little contact. On the
other hand, illegal immigrants, with low levels of both skill and education, are more
likely to respond to changes in farm income that may, in turn, correlate with more
employment opportunities for seasonal laborers. Though this variable also does not
include corporate farms, it may reflect the presence of larger and more profitable sole
proprietorship and partnership farms. Thus, those areas that only have small, family
owned farms would have lower total farm income, and these areas are less appealing to
immigrant populations. This is also consistent with the findings in the previous
regression. Higher profits equal larger farms; following the logic presented in the
previous paragraph, larger farms can more easily absorb the potential fines associated
with hiring illegal immigrants (and being caught). The areas with highly profitable farms
(that are not corporately owned) would still be more attractive to immigrants because they are more likely to include large farming establishments, explaining the negative $\beta_3$.

The results of regression including all relevant variables (the interaction between immigration status and unemployment insurance benefits, average earnings per job, jobs per worker, % farm, and farm proprietors’ income) can be found in Table 4. The probability that all of these variables are jointly equal to zero is essentially zero (F stat, pvalue), meaning that the correlation between overall economic conditions and legal immigrants is different from the correlation between economic conditions and illegal immigration.
V. Discussion and Conclusion

This study differs from both Cadena and Jaeger in its inclusion of both legal and illegal immigrants in an attempt to discern a difference between the decision patterns of both types of immigrants. In general, the results suggest that illegal immigrants are less responsive than their legal counterparts. Of the regressions discussed in Section IV, only two resulted in negative coefficients for the interactive terms—farm proprietors’ income and % farm. The negative coefficient in both these cases is not surprising. If we assume that illegal immigrants are more likely to participate in agriculture-based jobs than legal immigrants, than it would makes sense that illegal immigrants are more responsive to changes in said industry. The demographic characteristics of illegal immigrants having less education and fewer skills support this. Riechart and Massey (1979) studied the differences between illegal and legal immigrants in a single, specific Mexican town. Their findings, that illegal immigrants travel less than legal immigrants in the United States, are supported by the results that legal immigrants are, in general, more responsive to changes in labor market conditions.

There are many possible reasons why legal immigrants, in general, are more responsive than illegal immigrants to changes in economic conditions. One of the main reasons is the fact that illegal immigrants are, inherently, illegal. The probability of apprehension may increase with distance traveled. Thus, for illegal immigrants the benefits of travel may not outweigh the potential costs of detection and possible deportation. This is especially convincing in light of the costs the illegal immigrant bears to simply enter the United States. The decisions of illegal immigrants must be balanced
with the potential costs of apprehension as well as past costs incurred from initial entry. Legal immigrants do not necessarily have these constraints. Though legal immigrants have also have incurred costs during their transition to the United States, they do not have to account for the cost of detention.

Another reason that may account for the observed differences between legal and illegal immigrants is information asymmetry. Legal immigrants may have better access to information about changes in economic conditions. Higher levels of education may allow legal immigrants to better understand differences in regional economies and, consequently, to make decisions based upon this information. Illegal immigrants are disadvantaged because of possible language barriers as well as, in general, lower levels of education. Illegal immigrants may also have less access information on economic conditions. This is, of course, not to suggest that illegal immigrants are not as intelligent as legal immigrants but, rather, that illegals have barriers preventing them from fully utilizing information that may be available.

Thus, immigrants appear to respond to, and make migration decisions based on, changes in economic conditions that may range from the presence of agro-business to unemployment insurance benefits. This supports the findings in Jaeger (2007), the study upon which my thesis is based, Cadena (2010), as well as Riechart and Massey (1979). Specifically, Jaeger’s conclusions that legal immigrants congregate in areas with higher wages and lower rates of unemployment (more jobs per workers) are maintained. Though Cadena used a different method than Jaeger, he also found that low-skilled
workers are responsive to changes in the labor market. My research corroborates these findings.
### Table 1
Summary Statistics

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<th>N=</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
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<td>Immigrants</td>
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<td>4.491688</td>
<td>12.08497</td>
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<td>Unemployment Insurance Benefits</td>
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<td>Earnings by Place of Work</td>
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<td>Average Earning Per Job ($)</td>
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<tr>
<td>Jobs per Worker</td>
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<td>5.725829</td>
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<td>% Farm</td>
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<td>1.226342</td>
<td>1.106863</td>
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<td>Proprietors' Income</td>
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<td>Nonfarm Proprietor's Income</td>
<td>960</td>
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<td>Acres of Farm</td>
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<td>Personal Income</td>
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<td>Net Earnings</td>
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<td>Wage and Salary Disbursements</td>
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<td>Supplements to Wages and Salaries</td>
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<td>Unemployment Benefits</td>
<td>Average Earnings</td>
<td>% Farm</td>
<td>Farm Income</td>
</tr>
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<td>-----------------</td>
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<td>Legal Status</td>
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<td>N</td>
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<td>960</td>
<td>960</td>
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* p<0.1 ** p<0.01 *** p<0.001
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<th>Farm Acreage</th>
<th>Wage &amp; Salary Jobs</th>
<th>Proprietors' Income</th>
<th>Net Earnings</th>
<th>Earnings by Place of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Status</td>
<td>1.854***</td>
<td>2.257***</td>
<td>2.436***</td>
<td>1.914***</td>
<td>1.916***</td>
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<tr>
<td></td>
<td>[0.123]</td>
<td>[0.594]</td>
<td>[0.413]</td>
<td>[0.500]</td>
<td>[0.488]</td>
</tr>
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<td>Economic Condition</td>
<td>0.0118</td>
<td>-0.0562</td>
<td>-0.0166</td>
<td>-0.532*</td>
<td>-0.461</td>
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<tr>
<td></td>
<td>[0.302]</td>
<td>[0.100]</td>
<td>[0.0747]</td>
<td>[0.218]</td>
<td>[0.184]</td>
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<tr>
<td>Interactive Term</td>
<td>-0.0000169</td>
<td>-0.0401</td>
<td>-0.186</td>
<td>0.127</td>
<td>0.112</td>
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<tr>
<td></td>
<td>[0.0000151]</td>
<td>[0.115]</td>
<td>[0.136]</td>
<td>[0.373]</td>
<td>[0.316]</td>
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<tr>
<td></td>
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<td>[0.305]</td>
<td>[0.198]</td>
<td>[0.245]</td>
<td>[0.297]</td>
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<tr>
<td>R²</td>
<td>0.671</td>
<td>0.709</td>
<td>0.722</td>
<td>0.710</td>
<td>0.71</td>
</tr>
<tr>
<td>N</td>
<td>499</td>
<td>960</td>
<td>960</td>
<td>960</td>
<td>960</td>
</tr>
</tbody>
</table>

* p<0.1 ** p<0.01 *** p<0.001
Table 4

<table>
<thead>
<tr>
<th>Status*Unemployment Benefits</th>
<th>$\beta/[s.e]$</th>
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<tr>
<td>0.0277**</td>
<td>[0.00911]</td>
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<table>
<thead>
<tr>
<th>Status*Average Earnings per Job</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0.274*</td>
<td>[0.107]</td>
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</table>

<table>
<thead>
<tr>
<th>Status*Jobs per Workers</th>
<th>$\beta/[s.e]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.135</td>
<td>[0.0744]</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Status*%Farm</th>
<th>$\beta/[s.e]$</th>
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</thead>
<tbody>
<tr>
<td>0.310***</td>
<td>[0.0845]</td>
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</table>

<table>
<thead>
<tr>
<th>Status*Farm Income</th>
<th>$\beta/[s.e]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.214***</td>
<td>[0.0431]</td>
</tr>
</tbody>
</table>

| $R^2$                         | 0.739         |
| N                             | 960           |

* $p<0.1$ ** $p<0.01$ *** $p<0.001$
VII. Definitions

Variables (and descriptions\textsuperscript{15}) included. All monetary values are deflated to 2005 prices as based on BEA provided GDP implicit price deflators for 1983-2003.

Year: 1983-2003

Field Office: regional offices of the INS.

Personal Income: income received by all persons from all sources. Personal Income is calculated as the sum of wage and salary disbursements, supplements to wages and salaries, proprietors’ income with inventory valuation and capital consumption adjustments, rental income of persons with income, and personal current transfer receipts, less contributions for government social insurance.

Unemployment Insurance Compensation: unemployment compensation made up of the following: 1) state unemployment compensation, benefits consisting mainly of payments received by individuals under state-administered unemployment insurance (UI) programs, including the special benefits authorized by Federal legislation for periods of high unemployment; 2) unemployment compensation of railroad employees, received by workers who are unemployed because of sickness or because work is unavailable in the railroad industry and in related industries; 3) unemployment compensation of veterans who have recently separated from military service and who are not eligible for military retirement benefits.

\textsuperscript{15} Descriptions are quoted from the Bureau of Economic Development. For more information please visit the Bureau of Economic Development’s website: www.bea.gov.
Net Earnings: earnings by place of work—the sum of wage and salary disbursements, supplements to wages and salaries, and proprietors’ income (less contributions for government social insurance), plus an adjustment to convert earnings by place of work to a place of residence basis. BEA provided data is per capita.

Earnings by Place of Work ($000): sum of wage and salary disbursements, supplements to wages and salaries, and proprietors’ income.

Wage and Salary Disbursements: monetary remuneration of employees, including corporate officers’ salaries and bonuses, commissions, pay-in-kind, incentive payments, and tips. It reflects the amount of payments disbursed, but not necessarily earned during the year. Wage and salary disbursements are measured before deductions (i.e. social security and union dues).

Supplements to Wages and Salaries: employer contributions for employee pension and insurance funds and employer contributions for government social insurance.

Average Earnings per Job (dollars): total earnings divided by total full-time and part-time employment. Earnings equal the sum of three components of personal income—wage and salary disbursements, other labor income, and proprietors’ income. BEA employment series for state and local areas comprises estimates of the number of jobs, full-time plus part-time, by place of work. Full-time and part-time work is counted with equal weight. Employment of unpaid family workers and volunteers is not included.

Unemployment: a vector for unemployment derived from (total full-time and part-time jobs) divided by (total population).
**Farm:** the number of farm proprietors in a given region, represented as a percentage of the total number of proprietors.

**Nonfarm:** the number of nonfarm proprietors in a given region, represented as a percentage of the total number of proprietors.

**Population (persons):** the Census Bureau’s midyear population estimates are used. Except for college students and other seasonal populations, which are measured on April 1, the population for all years is estimated on July 1.

**Proprietors’ Income:** current-production income (including income in kind) of sole proprietorships and partnerships and of tax-exempt cooperatives. Corporate directors’ fees are included in proprietors’ income. Proprietors’ income excludes dividends and monetary interest received by nonfinancial businesses and rental incomes received by persons not primarily engaged in the real estate business.

**Nonfarm Proprietors’ Income:** the income that is received by nonfarm sole proprietorships and partnerships and the income that is received by tax-exempt cooperatives. National estimates of nonfarm proprietors’ income are primarily derived from income tax data. Because these data do not always reflect current production and because they are incomplete, the estimates also include four major adjustments: the inventory valuation adjustment, the capital consumption adjustment, the “misreporting adjustment” and the adjustment for the net margins on owner-build housing.
Farm Proprietors’ Income: the income received by the sole proprietorships and the partnerships that operate farms. It excludes the income that is received by corporate farms.

Total Full-Time and Part-Time Employment: estimates of the number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included. Employment estimates are designed to be consistent with the estimates of wage and salary disbursements and proprietors’ income that are part of the personal income series.

Wage and Salary Jobs: average annual number of full-time and part-time jobs in each area by place of work. All jobs for which wages and salaries are paid are counted. Full-time and part-time jobs are counted with equal weight. Jury and witness services, as well as paid employment of prisoners, are not counted as wage and salary employment.

Number of Proprietors: includes both nonfarm and farm proprietors.

Nonfarm Proprietors: number of sole proprietorships and the number of individual business partners not assumed to be limited partners. The nonfarm self-employment estimates resemble the wage and salary employment estimates in that both series measure jobs—as opposed to workers—on a full-time and part-time basis.

Farm Proprietors: farm self-employment is defined as the number of non-corporate farm operators, consisting of sole proprietors and partners. A farm is defined as an establishment that produces, or normally would be expected to produce, at least $1,000
worth of farm products—corps and livestock—in a typical year. The distinction between place-of-work and place-of-residence is not significant because most farmers live on or near their land. Similarly, because of the annual production cycle of most farming, the distinctions between the point-in-time, the average annual, and the any-activity temporal concepts of employment measurement are not significant.

**Status:** Legal or Illegal

**Immigrants:** the number of legal or illegal immigrants in a region (as organized by field office) per year
VII. Graphs

**AK Immigration 1983–2002**

**AZ Immigration 1983–2002**
References


