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Why I Won't "Go Back to Where I Came From":

An Economic Analysis of Illegal Migration

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April 23, 2021

Abstract

The United States has witnessed a declining yet still significant number of illegal immigrants crossing the southern border over the past decade, while the European Union experienced a rapid increase in the number of illegal immigrants within its borders, hosting over two million illegal immigrants in 2015. This paper seeks to provide guidance to European and United States lawmakers on creating effective immigration policy by identifying significant push and pull factors that are driving illegal migration from West and North Africa to Europe and from Latin America to the United States. This empirical analysis indicates that, in both the United States and European Union, GDP and favorable employment prospects are strong pull factors for illegal immigrants. Furthermore, low employment is a significant push factor for emigrants in West Africa and Latin America, reinforcing the need to address chronic structural problems that exacerbate unemployment in these regions.

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Background

Historically, labor shortages in the United States and Europe have prompted the relaxation of immigration policy. In the 1920s, the United States experienced a shortage of agricultural workers and sought to remedy this issue through the implementation of the Bracero program, providing temporary work visas to Mexican agricultural workers. As intended, this program increased the number of legal immigrant laborers in the United States. However, it also had the unintended consequence of increasing the number of illegal immigrants in the United States. By the early 1980s, the promise of higher wages drew in more than two million illegal Mexican workers to the United States (Devadoss 2020). The inflows of illegal immigrants kept increasing throughout the years with the United States experiencing a 194 percent increase in Central Americans living in the U.S. between 2000 and 2013 (Johnson and Woodhouse 2018). Initially, the U.S. tried to accommodate the new influx of immigrants by granting amnesty to migrant laborers through legislation such as the 1986 Immigration Reform and Control Act. However, the September 11th, 2001 terrorist attacks changed the way the U.S. viewed illegal immigrants (Devadoss 2020). Fear that immigrants pose a risk to the safety of citizens began to spread across the United States, so the government moved to strengthen its borders.

Despite their efforts, the U.S. government is unable to stop illegal immigrants from continuing to enter the country. Funding for both Customs and Border Patrol and Immigration and Customs Enforcement was expanded to \$9.2 billion in 2003 and eventually reached \$28.1 billion by 2018 (measured in 2003 dollars) to enhance efforts to deter illegal immigration and apprehend those already in the country (Devadoss 2020, 162). Further, in 2014, the United States pressured the Mexican government to increase efforts to apprehend illegal immigrants at the U.S.-Mexico border. This resulted in the launch of Programa Frontera Sur (Southern Border

Program). The Southern Border Program increased police presence at known migration routes, shut down railroads frequently used by migrants, and strengthened infrastructure at the Mexican border (Johnson and Woodhouse 2018). This program proved successful with Mexican authorities apprehending eighty-five percent more illegal immigrants between 2014 and 2016 (Johnson and Woodhouse 2018, 980). However, it did not completely deter migrants from trying to cross the U.S.-Mexico border. Instead, many migrants started to pursue more dangerous routes into the United States to avoid apprehension (Johnson and Woodhouse 2018). As a result, the number of illegal immigrants in the United States increased by another five hundred thousand between January of 2014 and January 2015, and more immigrants arrive each year (Baker 2018, 2).

Similarly, Europe finds itself struggling to control an influx of illegal immigrants after labor shortages in the European Union (EU) in the 1990s and early 2000s resulted in the relaxation of immigration laws. Between 1996 and 2008, twenty-two of the twenty-seven EU member states introduced policies that regularized illegal migrants working in Europe, resulting in the regularization of five to six million migrants (Ambrosini 2015). Some member states of the European Commission lowered salary requirements and exempted migrants working in high-demand industries from quota restrictions (European Commission 2015). They also made it easier for refugees, students, and other non-economic migrants to find jobs in high-demand industries. However, Europe's acceptance of immigrants eventually ended when the European migrant crisis peaked in 2015. In 2015, over two million illegal migrants were present in the EU

(Eurostat 2020).¹ European governments became overwhelmed with the number of asylum seekers and refugees arriving on their shores, unable to support all of their new arrivals financially and socially. Further, terrorist attacks in France on November 13th, 2015 changed public opinion about border control. The attacks were orchestrated by Abdelhamid Abaaoud, a Belgian national, who collaborated with several French and Belgian citizens, all of whom have been connected to the Islamic State militia, to carry out the plan (BBC 2016). The ease with which these attackers were able to travel between countries sparked fear among the European public about the lack of border security in the EU. Thus, public opinion in France and Europe strongly favored tighter border controls (Lendaro 2016). European governments are faced with the task of finding new and effective ways to secure their borders and reduce illegal immigration flows.

Previous immigration legislation proves to be disproportionate, as they overburden Southern European countries with immigrants. The Dublin regulation, enacted in 2003, deems asylum seekers the legal responsibility of the first country they enter. Since most immigrants enter by sea, coastal countries bear a substantial amount of this responsibility. Greece alone had 911,470 illegal immigrants present in 2015, compared to interior countries like Belgium and Czechia who had 16,275 and 8,165 illegal immigrants, respectively (Eurostat 2020).² Italy took action to alleviate the burden of immigrants on its country by pressuring the European Union to

1. Eurostat. 2020. Third country nationals found to be illegally present - annual data (rounded).

Luxembourg: European Commission.

2. Ibid.

remove embargos on Libya. This allowed Italy to provide equipment and supplies to Libya that they could use to capture immigrants and prevent them from crossing the Mediterranean Sea to get to Italy (Coluccello & Massey 2007). Southern European countries are very vocal about needing help from the rest of the EU countries to handle the rising number of new immigrants.

The European Union responded in 2015 by trying to prevent illegal immigrants from reaching Europe at all. The EU worked with Turkey to enact the Joint Action Plan (JAP) which prevents immigrants from entering the EU through Turkey. The JAP has some important tenets. First, all EU member states (except Hungary) agreed to a resettlement plan that would provide for the resettlement of twenty thousand migrants in the EU, though eighteen thousand spots were still unclaimed by 2019 (Lehner 2019, 178). Second, they also agreed to redistribute 120,000 refugees stranded in Italy and Greece across all member states, including Hungary. Third, the EU promised that for every Syrian refugee that was moved from Greece to Turkey, a Syrian refugee registered in Turkey would be resettled in Europe (Lehner 2019). Most importantly, the plan makes Turkey responsible for reducing the number of immigrants crossing the Aegean Sea to enter Europe. In return for their assistance, the European Union is committed to providing technology, money, and resources to aid Turkey in this task. However, Lehner argues that given the high number of Turkish citizens applying for asylum in the EU, especially following the 2016 coup d'état, it is unthinkable to deem Turkey a safe place for refugees and asylum seekers (Lehner 2019). The European Union is potentially putting the lives of these immigrants at risk by detaining them in Turkey.

European efforts to restrict the inflows of immigrants are starting to disintegrate. In early 2020, Turkey's President Recep Tayyip Erdogan announced to millions of asylum seekers and refugees that Turkey would no longer stand in the way of them reaching Europe. Erdogan

expressed frustration that the European Union was not doing enough to shoulder its share of the burden, and said Turkey would no longer uphold the terms of the Joint Action Plan (Wishart and Kozok 2020). The European Union is now potentially facing another wave of illegal immigrants arriving at its borders. The European Union and the United States need better action plans to properly address the problem of illegal migration. Otherwise, they will continue to see record numbers of immigrants appearing at their borders.

This paper seeks to provide guidance to governing agencies in Europe and the United States by determining what factors influence the number of illegal immigrants entering the United States and Europe, specifically focusing on migration flows from West and North Africa to Europe and from Latin America to the United States. Using linear techniques, this research identifies statistically significant push and pull factors of illegal migration. Identifying these push and pull factors will help discern what is causing this influx of illegal immigrants, allowing the United States and European Union to restructure immigration policy to properly address illegal immigration.

This thesis contributes to the existing literature on immigration by providing additional empirical analysis of illegal migration. Previous economic literature on illegal migration has been mainly theoretical and focused on how different policy options could influence migration trends. There has been limited regression analysis on illegal migration. This thesis fills the need for more empirical research and analysis of the push and pull factors of illegal migration. In identifying the statistically significant push and pull factors, this study provides additional guidance to economists and policy-makers who are identifying ways to reduce the incidence of illegal immigration in Europe and the United States.

Literature Review

A migrant is an individual who moves away from their place of residence to relocate to another place, either within their country or internationally. This relocation can be either temporary or permanent. Migrants decide to move for a variety of reasons which is explored later in this paper. Before exploring the reasons for migration, this paper explores how migration is carried out. Migration can either be conducted through legal channels where a migrant obtains a visa or other documentation permitting them to legally enter a country, or the migrant can enter a country through illegal means. This thesis focuses on the latter. According to the United Nations (UN), there are two modes of illegal migration, human smuggling and human trafficking (Sauer 2019). These modes describe the method by which an illegal immigrant enters their destination country. For the purpose of this paper, a migrant's country of origin is referred to as their home country. The country that they reside in after emigrating is referred to as their destination country.

Illegal Migration Through Human Smuggling

The UN identifies human smuggling as receiving financial or material payment for the transportation of an individual to a country where they are not a legal resident. Human trafficking is the transportation of an individual to a country where they are not a legal resident by means of force, coercion, or fraud (Sauer 2019). While these two practices differ, there are many similarities. This stems from the fact that many human trafficking victims begin their journeys as participants of human smuggling. Migrants who travel through these modes of illegal migration often experience the same push and pull factors (explained in detail later) for immigration. Smugglers and traffickers also have similar responses to government policies. Due to this, it is beneficial to examine these two practices in conjunction with one another in the

larger context of how illegal migration occurs. The next section examines how and why illegal migration occurs and what life is like for migrants who are smuggled or trafficked.

The dominant perception of illegal migration markets is that they are organized by large criminal rings that abuse and exploit migrants. However, this narrative has been challenged by researchers studying smugglers in the Middle East and Africa (Maher 2018). Achilli (2018) performs ethnographic field research in Syria to examine the relationship between smugglers and migrants. He finds that migrants did not perceive smugglers as immoral or exploitative. Most migrants observed classify smugglers as neither good nor bad and recognized their need for payment as a necessary part of business. The relationship between migrants and smugglers has a dynamic of cooperation and trust. They see themselves as allies against Europe's immoral system which does not uphold the humanitarian rights it promised. All of the refugees interviewed, with a few exceptions, had either been denied asylum by a European nation or had pending applications with indefinite wait times. Smugglers offer migrants a way to bypass the asylum application process and escape the political and economic turmoil in their home country sooner.

Many smugglers are motivated by morality and good intentions. Achilli's interviews with smugglers reveal that they often felt a moral duty to help their fellow countrymen. Achilli tells the story of Abu Hamza, a smuggler who began his career after failing to reach Europe as a migrant. He tried to enter Europe twice but was caught and deported both times. He felt it was his moral duty to help his fellow migrants avoid his fate, so he turned to smuggling. The Syrians used the term *muharrib* to refer to smugglers. This word comes with the moral responsibility of ensuring that their customers have safe and comfortable travels. Muharribs are expected to provide safe boats, charge reasonable prices, and be courteous to their customers. Achilli states

that most smugglers associate their job as a smuggler with piety and try to behave as muharribs. This sense of moral duty among smugglers is echoed in Maher's study of Senegalese human smuggling networks. Like the smugglers interviewed by Achilli, many of the smugglers in Maher's study report feeling a religious duty to protect their passengers according to Islamic law (Maher 2018). While profits are important to them, they are also guided by moral duty and a desire to help their people.

A desire to protect migrants is also found amongst smugglers in the United States. Sheldon Zhang's 2007 study of Chinese migrants in the United States revealed that some people who experienced abuse on their journey to the United States became smugglers to help their fellow immigrants avoid the same fate (Achilli 2018). In Latin America, many smugglers, known as coyotes, act as guardians for their migrants, protecting them from the dangers of travel. As of 2010, up to sixty percent of migrant women traveling through Mexico to the United States are expected to be raped (Amnesty International 2010, 15). This estimate has even reached as high as eighty percent of Latin women being raped while traveling to the United States (Nyczak 2016, 241). Migrants in Latin America also suffer unscrupulous amounts of violence from cartels, police, rural gangs, and immigration authorities on their journey. Coyotes can help migrants avoid routes populated with these dangers. Unlike the muharrib, the coyote is not motivated by religious duty. Coyotes need to keep migrants safe and ensure they enjoy their journey, so they will recommend their friends and families to use their services in the future. The importance of word-of-mouth recommendations to the success of a coyote's business leads many to work hard to ensure the safe passage of their customers. While they are motivated by different reasons, many scholars agree that smugglers around the world generally adhere to a customer-friendly code of conduct.

Human smuggling operations usually entail a single smuggler accompanying his clients to their destination or taking them to another smuggler who possesses the mode of transportation. Further, smugglers are also usually in the immediate circle of their clients or are recommended by someone in the client's immediate circle. Maher found that eighty-seven percent of the 170 people she interviewed personally knew their smuggler and the other thirteen percent met their smuggler through a friend or relative (Maher 2018, 39). Similarly, the smugglers in Achilli's study were often in the immediate circle of their clients (friends or family members). The same trend is observed in Latin America with *coyotes* usually being recommended by a family friend (Nyczak 2016). Thus, a significant part of human smuggling is conducted through small, interpersonal means.

Illegal Migration Through Human Trafficking

While many human smuggling interactions may be civilized and cooperative, there are still many smugglers who chose to exploit the migrants using their services. When this exploitation occurs, the interaction between the migrant and smuggler is classified as human trafficking. According to the United Nations, an estimated 2.5 million people are being trafficked in the world at any given time with around eighty percent of them being women and fifty percent being children (Wheaton 2010, 118). Human traffickers entice migrants by offering them falsified documents and money to cover the cost of relocation. While migrants may be aware of some of the tasks that will be asked of them, they are seldom aware of the full scope of what they will be forced to do, resulting in a loss of agency. A report by Polaris revealed that thirty-four percent of the Latina women involved in human trafficking in 2016 were originally being smuggled (Seelke 2019), demonstrating how easy it is for a human smuggling interaction to turn into human trafficking. Traffickers target vulnerable individuals from countries facing political

disarray, economic crisis, or natural disasters (Seelke 2019). A recent example of this is Venezuela.

Venezuela's recent economic crisis, characterized by hyperinflation and high unemployment, makes Venezuelan women and children particularly vulnerable to human trafficking (John 2019). In 2016, The United Nations estimated there were thirty-four thousand asylum applications by Venezuelans worldwide, a number that rose by another five thousand by mid-2017 (John 2019, 438). Those whose asylum applications were denied were more willing to accept offers from traffickers promising employment abroad. In addition to those seeking asylum, thousands more are fleeing to surrounding countries. As of 2017, Colombia, the main destination for Venezuelan migrants, is estimated to have 300,000 Venezuelan immigrants present (John 2019, 438). Venezuelans' high demand for emigration, coupled with the increasing popularity of sex tourism in the Caribbean, makes it even easier for human traffickers to exploit migrants (John 2019).

A similar situation is occurring in the Edo State of Nigeria. The Edo State of Nigeria is a major human trafficking hub. As of 2008, it is estimated that of all Nigerian women trafficked to Europe to work as prostitutes, over eighty percent are from the Edo State (Dave-Odigie 2008, 68). Nigerian gangs and organized crime are known to subject many women and children to forced labor and prostitution in various parts of Europe and Asia, including Italy. However, the situation in Nigeria is more complex than the traditional description of human trafficking.

While many Nigerian women are the victims of human trafficking, they do exhibit a certain degree of willingness and even eagerness to be trafficked. Despite knowing some of the risks involved with human trafficking (rarely do victims have enough information to know all of the risks involved with human trafficking), many Nigerian women still seek out traffickers and

willingly engage in sex work abroad (Vanderhurst 2017). Nigerian women have even stated that they “want to be trafficked” (Vanderhurst 2017, 195). At first, it may seem shocking and confusing that these women would express interest in being sex trafficked, but there is a rational, economic motive driving their decision. These women, much like the victims in Venezuela, have a desire to work. Economic disparity in their home country has driven them to want to emigrate by any means necessary, even if it means being trafficked. Nigeria has suffered from high unemployment rates for decades, and the government has failed to adequately address this issue, leaving these emigrants with little expectation that the economic conditions in Nigeria will improve. They lack any hope that they will be able to find economic prosperity and escape poverty in Nigeria. This lack of hope makes them willing to accept offers from human traffickers. Emigrants believe there is a possibility of finding economic success in Europe, while life in Nigeria appears completely bleak. Until the Nigerian government can restore faith that conditions will improve in Nigeria, these women will continue to contact traffickers, and this industry will thrive.

Conditions Upon Arrival

When immigrants arrive in their destination countries, their lives are not always what they expected. For labor immigrants, especially, there is an expectation that life will be better in the destination country, and they will have better job opportunities. However, this is not always the case. For high skilled immigrants, employment outcomes are ambiguous. Studies have found that immigrants are often underemployed, working jobs that are below their education and skill levels. This mismatch of skills to occupation is caused by several reasons: workplace discrimination, language barriers, lack of formal educational credentials, etc. Castagnone et al. (2015) conduct a study of Senegalese, Ghanaian, and Congolese immigrants living in Southern

Europe to determine the occupational trajectory of immigrants. For Ghanaians, 70.7 percent of those included in the survey hold college degrees. Only 59.8 percent worked in high-skilled jobs prior to migrating, but 62.60 percent are now employed in high-skilled jobs in the European Union. However, for Congolese migrants, 63.7 percent were employed in high-skilled labor positions prior to immigrating, and now only 42.40 percent are employed in high-skilled labor positions (Castagnone et al. 2015, 211). The same trend is seen in Senegalese migrants. Further, Italy's 2018 Report of the Ministry of Labour found that only twenty-six percent of foreigners who held STEM degrees were working in relevant fields (Fondazione ISMU 2018, 37). In general, immigrants are likely to work low-skilled jobs in industries such as construction, domestic labor, and factory work (Fondazione ISMU 2018). The report also notes that in 2018, blue-collar and low-skilled jobs made up more than 76.3 percent of foreign employment in Italy (Fondazione ISMU 2018, 36). Like their highly skilled counterparts, low-skilled workers also face uncertain labor outcomes. Castagnone et al. (2015) found that for unskilled Senegalese and Congolese immigrants, employment increased after migration while it fell for Ghanaian immigrants. Moreover, the European Union reports that 48.6 percent of non-EU immigrants living in the EU are at risk of living in poverty (Fondazione ISMU 2018, 47). Economic outcomes for immigrants are varied, and for many, they are bleak. However, there is still a chance that some will find economic prosperity. As long as hope exists, human smuggling will continue.

Often considered modern-day slavery, human trafficking imposes many cruelties on its victims as well. In contrast to those who are smuggled, human trafficking victims have prolonged contact with their traffickers after reaching their destination country. Mohajerin (2006) explains that the traffickers lure women in with the promise of employment abroad, then,

after transporting them to the destination country, force them to pay off debts for the cost of transportation. They often exploit their victims for labor or sexual purposes in the destination country. To condition female victims for their lives as prostitutes, traffickers will choose to brutalize their victims. Victims face cruelty such as physical abuse, being terrorized, and burning. In addition to the abuse they face from their traffickers, they also experience the fear of being arrested or deported if caught by government authorities. Life for trafficking victims can look extremely different from those who participate in human smuggling, yet the conditions that draw them into illegal migration are often similar. Regardless of whether they are exploited or not, many illegal migrants are driven by the same push and pull factors.

Push and Pull Factors

Western governments are struggling to find effective solutions to end human trafficking and human smuggling, but social science research can help. Social scientists cite push and pull factors as driving immigration. Push factors are conditions in a migrant's home country that induce them to emigrate. These are often things like political turmoil, economic disparity, and violence. Pull factors are qualities of the destination country that attract migrants to immigrate. These can include things like job opportunities, democracy, and high GDP. Migrants weigh these push and pull factors when deciding whether or not to immigrate. The next section discusses these push and pull factors.

Push Factors

Violence and war are prominent push factors for emigration around the world. The prevalence of crime and gang violence in Central American countries, such as Honduras, El Salvador, and Guatemala, has pushed migrants to contract smugglers to transport them to the

United States (Suárez et al. 2016; Nyczak 2016). Women in Latin America specifically face copious amounts of violence including domestic violence, sexual violence, human trafficking, gang violence, and state violence. El Salvador, Guatemala, and Honduras have three of the highest femicide rates in the world (Cook Heffron 2019). A lack of confidence in the justice system, in addition to societal pressures, causes violence against women to be an extremely underreported crime in these countries. Without the ability to seek protection from law enforcement, women turn to emigration as a means of escaping the violence they face at home (Cook Heffron 2019).

Further, Hatton and Williamson (2003) find that coup d'état, guerilla warfare, and civil wars were some of the main driving factors for African refugees. Bohra-Mishra and Massey (2011) study the effects of violence on migration in Nepal and found that violence decreases the chance of emigration until a certain threshold is met, then violence increases the chance of emigration. Further, violence is more strongly correlated with migration out of the country than with internal migration. As war and violence have ravished developing nations, they've left the citizens of these countries in unthinkable danger. Without stable and effective governments to address these problems, migrants are left with emigration as their only means of survival.

Migrants also emigrate for economic reasons. The prospect of remittances serves as a particularly strong motivator. Remittances are income earned by migrants in a foreign country that are sent to residents (usually family or friends) in their home country. As immigration has increased throughout the years, so has the popularity of remittances. Remittances have become the second-biggest source of external income for developing nations (Ohonba and Agbontaen-Eghafona 2019). In 2005 alone, the OECD estimated \$126 billion was sent by migrant workers to their home countries (Cohen 2011, 104). They offer migrants a way to take care of the family

members they leave behind. The families use remittances to pay bills, create businesses, pay school fees, purchase homes, and more (Ohonba and Agbontaen-Eghafona 2019). The desire to improve their family's economic standing motivates many young people to migrate abroad.

Countries with weak economies also risk seeing high levels of emigration. As mentioned earlier, hyperinflation and high unemployment in Venezuela have driven people to want to emigrate (John 2019). After the implementation of the 1986 structural adjustment program in Nigeria, emigration rates also increased. The structural adjustment program saw the devaluation of the Nigerian Naira, with inflation increasing to 72.8 percent in 1995, and a seven percent unemployment rate in 1987 (Nwajiuba et al. 2007, 103). Between 1972 and 1980, Nigeria had a nine percent emigration rate. However, between 1986 and 1990, the emigration rate rose to thirty-eight percent (Nwajiuba et al. 2007, 102). The grim economic outlook in Nigeria resulted in a brain drain of highly skilled labor migrating out of Nigeria to Europe, The United States, and other developed countries (Ohonba and Agbontaen-Eghafona 2019). In Mexico, declines in real wages push people to migrate (Hanson 2006). Further, per capita GDP has been proven to have a negative relationship with emigration rates (Hatton and Williamson, 2003; Hanson and McIntosh, 2010; Majeed and Malik, 2017). Countries with lower per capita GDP are more likely to experience higher levels of emigration. When a country's economy suffers prolonged damage, citizens are often left in a position where emigration is their only chance of finding economic prosperity.

Changes in the labor supply of a country can also serve as a push factor. Hanson (2006) finds that the number of people born in Mexico is positively correlated with emigration to the United States. Population growth in Mexico serves as a shock to the labor supply and when these shocks occur, immigration rates to the United States increase. Similarly, increases in the

populations of African countries have induced migrants to leave. When African refugees are forced to leave their homes, most of them emigrate to neighboring countries. This swells the populations and labor supply of the countries to which they migrate. This creates a crowding-out effect, prompting citizens of the destination country to leave (Hatton and Williamson 2003). However, Bohra-Mishra and Massey (2011) find that rising household size reduces the probability of emigration in the Chitwan district of Nepal. In particular, each addition to the household reduces the odds of international migration by 0.122 (Bohra-Mishra and Massey 2011, 421). Therefore, population growth has ambiguous effects on migration.

Pull Factors

In addition to push factors, various pull factors encourage immigration. High-income countries have a demand for cheap labor in informal markets, such as prostitution, domestic work, and factory labor, that attract immigrants (Hernandez and Rudolph 2015). The United Kingdom alone had 76,972 job vacancies in the personal care industry and 43,145 in personal service in 2014 (European Commission 2015). Migrants looking for jobs abroad are eager to fill these vacancies. By 2017, foreigners made up over twelve percent of the Italian labor market, accounted for 10.5 percent of employed persons, and received approximately twenty percent of the labor contracts enacted in 2017 (Fondazione ISMU 2018, 35). Ongoing job vacancies in high-income countries are likely to continue to attract immigrants looking for better economic outcomes.

Migrants are also attracted to high-income countries due to income differentials. Hatton and Williamson (2003) find one of the most significant factors in determining net-out migration in Africa is the log wage ratio between the foreign and domestic country. As this ratio increases, net out-migration also increases. Hanson (2006) did a comparison of wages in the year 2000 and

found that male Mexican immigrants in the United States with only four years of school from ages eighteen to twenty-two earned an hourly wage of \$7.83 compared to the \$1.36/hr wage earned by their counterparts in Mexico (Hanson 2006, 893). This partially explains why the number of Mexican immigrants entering the United States has continued to grow over the years, despite government efforts to reduce immigration flows.

Most Significant Factors for Human Trafficking

Hernandez and Rudolph (2015) explore the push and pull factors more in-depth by examining what factors influence the number of human trafficking victims found in European countries. Data is collected from Austria, Belgium, Czech Republic, Denmark, Greece, Ireland, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. They find trafficking flows increase with the income differentials between home and destination countries. Per capita GDP and distance are both found to be significant at one percent³, with trafficking victims being more likely to be found in high-income countries that are close to their home country. Further, a strong legal system in the destination country is correlated with fewer reported human trafficking victims (significant at one percent), but the strength of the legal system in the home country is not significant, meaning having a good legal system in the home country is not expected to significantly decrease the number of human trafficking victims leaving

3. Significance levels detail how much of the variation in the dependent variable (the number of human trafficking victims found in a country) can be explained by the variation in the independent variable. A variable that is significant at ten percent is considered to be a good predictor of the dependent variable, significant at five percent is a great predictor, and significant at one percent is the best predictor.

that country. Many traffickers lure in victims with job promises, and the victims do not realize they have been trafficked until they are already in the destination country. This makes it more difficult for governments in home countries to identify human trafficking victims early. This suggests that the institutional quality of the home country does not influence how human traffickers operate. Another variable considered is how easy it is to enter the destination country. When the destination country does not require a visa for entry, human trafficking numbers are more likely to increase. This variable is significant at one percent, meaning it is a very strong predictor of which countries human trafficking victims are likely to be found. Governments hoping to stop human trafficking will probably need stricter visa policies. Finally, human trafficking flows are positively correlated with refugee and immigrant flows from a home country to a destination country (significant at one percent). This is expected since many traffickers find their victims amongst refugees and migrants.

Majeed and Malik (2017) also examine prominent push and pull factors affecting human trafficking flows. The results find that there is a positive relationship between globalization (significant at one percent), and the odds of a country being the source of human trafficking. Globalization in this context refers to economic, social, and political globalization as measured by the KOF index. When globalization increases by one unit, the log odds of a country being the source of human trafficking also increases by 0.031 units (Majeed and Malik 2017, 14). Per capita GDP is also significant at one percent in determining the log odds of a country being the source of human trafficking, meaning it is a strong predictor of which countries will be the source of human trafficking. The regression shows a negative relationship between the two variables meaning that more affluent countries are less likely to be the source of human trafficking. This is consistent with the prevailing theory that most human trafficking victims

originate in developing countries. Majeed and Malik's research also shows that democracy within a country and population size have positive relationships with being the source of human trafficking. Larger and more democratic developing nations are more likely to be the source of human trafficking than smaller, more restrictive countries. As expected, results also found that countries that have better control over corruption are less likely to be the source of human trafficking.

In determining the log odds of being a destination country for human trafficking, per capita GDP, democracy, globalization, and corruption are all statistically significant. As expected, per capita GDP and globalization had positive relationships with the log odds of being a destination country meaning that wealthier, more globalized countries are more likely to have human trafficking victims present. Further, democracy has a negative relationship with the odds of being a destination country. More democratic nations are less likely to have human traffickers transporting people into that nation. This is likely because democratic nations are more likely to prosecute and imprison traffickers. Again, corruption has a negative sign, showing that eradicating corruption in a nation's government can help alleviate the problem of human trafficking.

Policies Affecting Migration

As more research has been conducted to identify these push and pull factors, governments have taken notice. Efforts have been expended to address economic disparity in developing countries in hopes of reducing illegal immigration flows. During the Obama administration, the United States provided more than \$750 million in aid to Central American countries to help with economic issues (Sheridan and Sieff 2018). The World Bank offers economic assistance to underdeveloped and developing countries to promote economic

prosperity. In addition, the developing nations themselves have worked harder to improve their global economic standings and increase their GDP. However, despite the growth of many developing countries, these nations are still seeing large numbers of migrants exiting their countries. Akeju and Olanipekun (2014) offer insight into why these countries are still seeing mass exoduses through an examination of Nigeria.

Fostering Economic Growth

In the 1970s, under the instruction of the World Bank, Nigeria implemented its structural adjustment program. As stated earlier, the structural adjustment program had catastrophic effects on Nigeria's economy and resulted in a spike in emigration. Since then, Nigeria has turned its efforts towards increasing GDP through oil exports. According to Okun's law, this should help decrease unemployment in Nigeria, which will consequently decrease emigration. However, research has shown that Okun's law does not apply to Nigeria. Okun's law states that there is an inverse relationship between GDP and unemployment. When there is a one percent increase in GDP, there will be an expected 0.3 percent decrease in unemployment (Akeju and Olanipekun 2014, 95). From the long-run cointegration, the study found that unemployment is insignificant in determining GDP growth. In fact, both indicators increased over time, violating Okun's law. The error correction model showed that a one percent increase in unemployment resulted in a 0.097 and 0.069 rise in real output in the first and fourth periods, respectively (Akeju and Olanipekun 2014, 96). Overall, the paper finds that Okun's law does not apply to Nigeria. High levels of unemployment are correlated with increasing economic growth. Current economic policy in Nigeria focuses on economic growth and ignores unemployment. If governments are going to address issues of illegal emigration, they will have to start gearing policies towards reducing unemployment rather than focusing solely on GDP. Otherwise, Nigeria and similar

countries will continue to see high incidences of illegal emigration during periods of economic growth.

Wage Protection

As Akeju and Olanipekun highlighted, the labor market is critical to addressing illegal migration. As a result, policies that target the labor market should receive consideration when deciding how to address illegal migration. One such policy is the minimum wage. In developing nations where competitive wages are below the subsistence level, minimum wage policies can ensure people have enough money to cover basic needs and potentially reduce the need for people to migrate. Sun and Tawada (2007) examine the impact of a minimum wage policy on illegal migration flows. They look at a situation where a minimum wage policy is enacted in the home country and find it has ambiguous effects on migration. Increasing the minimum wage in the home country will decrease the wage gap between the destination country and the home country, which discourages emigration, but it also reduces the number of people in the labor force in the home country. Both of these effects result in higher unemployment in the home country. Higher unemployment means the expected wage gap between the two countries increases and workers will want to migrate to the destination country again. Therefore, the effect of increasing the minimum wage in the home country on migration flows will depend on the elasticity of employment in the home country. If employment is inelastic to minimum wage changes, then emigration will decrease. When the minimum wage increases, the wage gap between the two countries will decrease, but unemployment will not increase enough to induce people to emigrate out of the country. When employment in the home country is elastic to an increase in the minimum wage, emigration will increase. The change in unemployment,

however, is unknown. The increase in the minimum wage acts to increase unemployment, but the exodus of workers lowers unemployment.

When employment is elastic to changes in the minimum wage in the home country, the destination country is better off while the home country is worse off. A higher minimum wage increases illegal immigration which supplies more labor to the destination country, facilitating economic growth. The smaller labor supply in the home country reduces potential growth. On the other hand, when employment is inelastic to changes in the minimum wage, the destination country is hurt while the effect on the home country is ambiguous. The increase in the minimum wage decreases the wage gap between the countries, so fewer people want to illegally immigrate which hurts economic growth in the destination country. In the home country, wages are higher, but unemployment also experiences a slight increase, so there will be ambiguous effects on economic growth. In summary, countries with an inelastic labor demand curve can use higher minimum wages to reduce emigration. However, they will not be able to predict what the effect will be on their economy. This illuminates one of the problems countries face when developing policies regarding illegal migration. It is difficult to predict the effect on the well-being of the country.

Sun and Tawada (2007) examine how immigration policies affect the economies of the home and destination countries. In the model, there are two countries, the home country and the destination country. Each country has capital and labor as factors of production. The home country is assumed to be labor abundant, and the destination country is capital abundant. Since there is a smaller supply of labor in the destination country, wages are higher in the destination country than in the home country. This wage gap is something that is regularly observed in illegal migration patterns from developing countries to developed countries. Sun and Tawada

find that when the destination country increases spending on police enforcement of immigration laws, illegal immigration decreases. As a result of this decrease in immigration, the wage gap between the two countries increases. The wage rate in the destination country increases, due to the smaller supply of labor, and the rental rate falls. Unemployment in the home country will increase due to the fall in illegal emigration, but production is unaffected. Increased expenditure on enforcement in the destination country will decrease the national welfare of the home country (higher unemployment), but it will have ambiguous effects on the destination country. Stricter enforcement will reduce labor movement and, as a result, decrease economic efficiency. However, the revenues made by enforcing fines on employers who employ illegal immigrants can increase the destination country's national income. Sun and Tawada propose that fines rather than police enforcement should be used to combat illegal immigration. Police enforcement drains the country of resources while fines will contribute to national income. When employers have to pay higher prices for illegal labor, they will hire fewer illegal immigrants. This will result in a decrease in the wage gap for illegal immigrants between the two countries. Previously, they could earn higher wages in the destination country because employers did not face a hefty fine and could afford to pay higher wages. With higher fines, the cost of illegal labor increases, and employers respond by decreasing the wages they pay immigrants to account for the higher cost of employment. If the wages in the destination country become low enough that they are equal to or less than those in the home country, migrants will elect to remain in the home country, decreasing migration flows.

Remittances

In addition to determining which immigration policies are economically efficient, governments have to consider the cost of reducing immigration flows. For countries that are the

source of illegal migration, a reduction in emigration will negatively affect national income. As discussed earlier, remittances have become one of the largest sources of outside funding for developing nations. These nations receive billions of dollars each year in remittances from migrants working abroad. Remittances help citizens pay school fees, purchase real estate, build houses, start businesses, and obtain transportation. Remittances serve as a major source of national income and investment for these countries. Sharma and Cárdenas (2018) study the impact of remittances in Mexico to shed light on how remittances can affect the workforce of a home country. The study finds that remittances are statistically significant at one percent and positively correlated with labor force participation rates in Mexico. This positive relationship between remittances and labor force participation rates can be explained as the substitution effect dominating in Mexico. When family members receive remittances from emigrants working abroad, they invest this money into businesses which increases labor force participation. In addition, an increase in remittances decreases the duration of unemployment in Mexico. In light of this, emigration, including illegal emigration, can prove helpful to a home country's economic condition.

On the other hand, the study also found that remittances are negatively correlated with median hours worked (significant at ten percent). The family members of emigrants have a larger amount of non-labor income, so they elect to work fewer hours. Further, remittances increase the reservation wage (the wage at which an individual decides to join the labor force) for family members of emigrants. Higher reservation wages make people less inclined to enter the labor force at all. Remittances were statistically significant at one percent for determining employment for low-income workers. When remittances increase, the employment of low-income workers (those earning the minimum wage or working part-time) decreases. This can negatively affect

economic efficiency in a home country by decreasing labor force participation. Remittances also hinder the ability of governments to combat human trafficking. In Nigeria, citizens who rely on remittances for survival are less willing to cooperate with the police to apprehend traffickers (Ohonba and Agbontaen-Eghafona 2019). In fact, people are willingly sending their female family members abroad with traffickers to get money. Remittances can do just as much or more harm to a country as they can good. As a result, most countries have decided to take action against illegal emigration despite its potential financial benefits.

Mitigating Trafficking

While efforts have been made to reduce the overall incidence of illegal migration, special efforts have been made to eliminate human trafficking in particular. The next section examines the effectiveness of these policy initiatives. The United States' annual Trafficking in Person report has put international pressure on the world's governments to end human trafficking. The results of this effort are encouraging but show that governments still have a long way to go before they end human trafficking. Frank (2013) collects eleven years of data on human trafficking, using the United States' annual Trafficking in Person report as his source. The reports include statistics from every country that reported having at least one hundred cases of human trafficking in a given year. Collecting 1,587 observations for the 2000 – 2011 time period, he finds that sixty-nine percent of countries have some laws against human trafficking but only twenty-eight percent make human trafficking completely illegal (Frank 2013, 19). In addition, only forty-six percent have comprehensive enforcement of anti-human trafficking laws (Frank 2013, 19). A weak legal structure makes it nearly impossible for governments to adequately address the problem of human trafficking, explaining why it is still so prevalent today.

Further, some governments are not investing in protecting and assisting human trafficking victims. In his data, Frank finds that only forty-two percent of observed countries provide victim services, and thirty percent report having punished victims in some manner (Frank 2013, 19). There appears to be a lack of concern about assisting victims, which is counterproductive to combating human trafficking. If victims do not feel safe and protected by the government, they are less likely to come forward and report their abusers. This makes it incredibly difficult for governmental agencies to identify and prosecute traffickers. As a result, human trafficking continues to thrive.

Another problem with the way governments are handling human trafficking is their patronizing of victims. Vanderhurst (2017) conducts a study in a shelter for women who have been identified as human trafficking victims or potential victims by Nigeria's National Agency for the Prohibition of Trafficking in Persons. Vanderhurst observes that many victims at the shelter are kept there against their will and completely isolated from their families. While the counselors at the shelter claimed the women were free to leave at any time, they had padlocks on the shelter doors and told the women that they would leave when God permitted it. The practice of holding trafficked women in these prison-like facilities is common around the world but has often been criticized for being patronizing and counterproductive. This practice stems from the idea that victims are fragile and incapable of making decisions for themselves, therefore the government must step in and make decisions for them. This characterization of victims violates their agency to make decisions about their own lives, and as Berman argues, ignores the very rational reason people get involved in human trafficking, the desire to work. The Nigerian women who claimed they wanted to be trafficked did not say that because they wanted to be exploited. They made that statement because they want to find work and saw no possibility of

doing this in Nigeria. The desire to find employment is what drives most people to contact human traffickers and smugglers. If governments want to eradicate these practices, then they will have to address the employment needs of migrants.

Belgium, Italy, and the United States have tried to fight human trafficking by addressing the employment needs of migrants. In Belgium, human trafficking victims can receive temporary work visas if they assist in the prosecution of their traffickers (Berman 2010). Similarly, the United States grants human trafficking victims T Nonimmigrant Status visas (T-visas), which allows human trafficking victims to live and work in the United States for up to four years if they help with the prosecution of their traffickers (U.S. Citizenship and Immigration Services 2009). Italy's Article 18 of Italian Law allows people who self-identify as human trafficking victims to receive assistance from churches, non-governmental agencies, and other social assistance organizations if they face danger upon return to their home country. These individuals are not required to speak or cooperate with the police and are eligible to apply for temporary visas that are renewable if the victim finds employment (Berman 2010). However, the temporary work visas offered by these countries often go unused. Between 2008 and 2015, the United Nations reported there being 11, 779 detected cases of human trafficking in the United States (United Nations 2017). However, according to the U.S. Citizenship and Immigration service's 2016 report, only 6,114 victims (fifty-two percent) applied for the T-visa (U.S. Citizenship and Immigration Services 2016). Given that most human trafficking victims are driven by a desire to work, it is unlikely this gap is due to victims not wanting the T-visa. More likely explanations are that this information is not made available to identified victims or that victims are too afraid to identify their traffickers. All three of these visa programs require victims to prove they have been trafficked which is difficult to do without identifying and facing their traffickers. Those

who are not able to do this face deportation. This is the case for most of Italy's human trafficking victims (Berman 2010). As well-intentioned as the temporary visas provided by Belgium, Italy, and the United States are, they still fall short of actually helping victims. Deportation just sends victims back to their home countries where they are vulnerable to being defrauded and exploited by traffickers again.

Formulating the Theoretical Market for Illegal Migration

For governments aiming to reduce the incidence of illegal immigration, understanding how the market for illegal immigration operates can help facilitate the creation of better immigration policies. Under perfect conditions, the market for labor migration involves two actors, the migrant and the employer. Migrants in the home country provide the supply of labor and employers in the destination country create the demand for labor. Labor shortages can drive employers to seek migrant labor. In addition, illegal migrant labor is generally cheaper than domestic labor because employers are not required to pay the minimum wage or provide fringe benefits, so employers who do not fear being caught by law enforcement will seek out illegal migrant labor. Labor shortages and the lower cost of migrant labor draw employers into the market for migrant labor. The Roy Model explains why migrants enter this market. According to the Roy model, a person will choose to immigrate if, given their skill level, they can earn higher wages in their destination country than their home country. When the prevailing wage in the destination country is higher than their current wage, a migrant will enter the market for migrant labor. Under perfect conditions, employers and migrants can freely enter into labor contracts, and the market will be in equilibrium.

However, when there are laws preventing a migrant from freely traveling to the destination country, the market falls out of equilibrium, and a derived demand for smugglers is

created. Migrants in search of work are not able to reach the employers that want to hire them when strict immigration laws are enacted. This causes the market to fall out of equilibrium. The only way to get it back in equilibrium is for the migrants to enter the destination country illegally. Migrants are often not familiar with the route from their home country to the destination country and lack the means of transportation, so they employ the services of a middleman, who may be either a smuggler or trafficker, to transport them to the destination country. This creates a derived demand for human smugglers and traffickers. The introduction of middlemen results in the creation of two submarkets within illegal migration.

The first submarket consists of employers in the destination country and smugglers. Migrants serve as the commodity in this market. Employers create a demand for migrant labor and smugglers supply migrants to the market. Wheaton et al. (2010) explore this market in their research. They model this industry as monopolistically competitive with many sellers (traffickers), buyers (employers), and differentiated products (people being trafficked). Employers hiring trafficked individuals face an upward-sloping supply curve because at higher prices traffickers are more willing to enter the market and provide more product (trafficked individuals). Suppliers will only supply at relatively high prices because production costs are high in this market, and they need to earn a profit. Traffickers face a variety of costs: transportation, creating falsified documents, fines by governments, prison time, and some traffickers will even send money to the families of their victims as a sign of goodwill. In the short run, the human trafficker earns economic profit from his work because average total cost is well below the price of his product. However, as the trafficker increases the number of people they transport, average total costs increases. At a certain point, trafficking will not be profitable anymore.

Looking at the demand side of the market, buyers created a downward sloping demand curve. Firms are only interested in illegal labor at low prices. The appeal for illegal labor resides in the fact that firms can pay these individuals low wages, decreasing their labor costs. Also, because they employ illegal labor, firms are not subject to workers' rights or human rights laws. They only have to supply the bare minimum of well-being to their trafficked workers. Trafficked labor is also easier to fire because firms are not required to pay severance pay or anything else to workers who outlive their usefulness. However, as traffickers increase the price of their product, illegal labor loses its appeal. Also, firms can be fined by the government if they are found to employ illegal immigrants. This increases the cost of illegal labor and makes it less attractive. At a certain price, employers will just choose to employ legal labor because the costs are the same for illegal and legal workers. Therefore, the price of trafficked labor needs to be high enough to entice traffickers into the market but low enough that trafficked labor is still cheaper than legal labor. Knowing this, governments should find a way to increase the cost of illegal labor for firms, so they are less inclined to hire illegal labor. They should also increase the costs for traffickers to drive them out of the market.

The second submarket formed from the introduction of middlemen is the market for human smuggling where emigrants serve as the buyers and smugglers are the sellers. In this market, transportation is the commodity being sold. Low-skilled emigrants populate this market because they lack the time, knowledge, and financial resources to emigrate on their own. Therefore, they hire a smuggler and pay a fee to be transported to their destination country. High-skilled migrants are usually excluded from this market because it is presumed that they have the resources to finance their own journeys to the destination country. As mentioned earlier, smugglers incur high costs when smuggling migrants into the destination country, so they charge

high prices for their services. Therefore, the price in this market has to be low enough that a low-skilled migrant can afford it and high enough to cover the costs to the seller. If governments can find policies that alter this price and throw the market out of equilibrium, they could potentially reduce or eliminate human smuggling and trafficking. The following researchers consider what these policies could be.

Tamura (2013) examines how smugglers would respond to changes in immigration enforcement practices. Tamura's model operates in the confines of two countries: the home country and the destination country. Perfect information and risk-neutrality are assumed in this model. Tamura finds that if governments focus their attention on increasing efforts to apprehend smugglers within the destination country and increase the marginal penalties for smuggling, the flow of illegal immigrants into the destination country will increase. As stated earlier, there are two types of middlemen in the human smuggling market. There are human smugglers and human traffickers. Human traffickers only decide to traffic their victims when the potential earnings of the migrant outweigh the additional cost they incur by prolonging contact. Prolonged contact increases their chances of being apprehended and prosecuted by law enforcement. When governments increase efforts to apprehend smuggling within their borders and increase the marginal penalties for human trafficking, smugglers no longer find it beneficial to exploit the migrants and elect to be smugglers instead of traffickers. Under the assumptions of this model, human smugglers are not affected by the increased efforts of governments to apprehend and penalize smugglers within their borders because they end all contact with migrants at the border. As a result, all human smugglers will choose to remain smugglers and not become traffickers. This will attract more customers into the market because migrants are more willing to enter the market for human smuggling if they know their smuggler will not exploit them. When all

smugglers become nonexploitative, the demand curve for transportation services will shift outwards signaling an increase in demand. This outward shift in the demand curve results in a higher quantity of migrants being smuggled into the destination country.

For governments seeking to reduce the overall flows of illegal immigration, Tamura suggests increasing apprehension at the border as this will act as a deterrent for both human traffickers and human smugglers. Given that penalties are severe, this will increase the cost for the services of smugglers, reducing the number of smugglers providing services and raising the equilibrium price. Angelucci (2012) finds support for this assertion during their study of border enforcement along the United States- Mexico border. When the United States government enacted stricter border patrol enforcement between 1987 and 1996, the cost of smuggling increased substantially. The prices smugglers charged for their services increased twenty-two percent during the 1970 to 1990 time period, with smugglers charging an average of 1,816 pesos for their services in the 1990s (Angelucci 2012, 339). The expectation is that the higher smuggling fees will deter immigrants from illegally entering the United States.

However, Gathmann (2008) finds that migrants respond to increases in border security (measured by the number of watchmen hours) by changing their method of immigration rather than not immigrating at all. When border security increases along popular migration routes, immigrants turn to other routes, including traveling through the desert and rural areas. Further, Gathmann finds that smuggling fees, in general, are not very responsive to changes in border security, but increases in border security at certain ports of entry do have a significant effect on smuggling fees along other routes. Smugglers charge higher fees along these alternative routes, likely responding to an increase in demand by immigrants trying to avoid border security. Gathmann's findings examining immigration flows from 1972 to 2003, so to get a more recent

look at how immigration flows, and smuggling fees respond to border security, this paper examines the relationship between these three variables from 1992 to 2018. The results are discussed later in the paper.

Friebel and Guriev (2006) examine the market for human smuggling consisting of migrants and smugglers as well. Their model focuses on the influence of deportation policies on this market. Their model includes a few basic assumptions. First, immigrants have the option to either work in the illegal or legal sector of the labor market in their destination country. Second, wages are higher in the legal sector, and the risk of deportation only exists in the legal sector. Finally, if a low-skilled immigrant elects to work in the legal sector, they can default on paying smugglers their fee for transportation, as smugglers have no enforcement power in the legal sector. Given these assumptions, Friebel and Guriev find that when governments in destination countries enact stricter deportation policies, illegal immigration increases. Low-skilled immigrants have the option to work in the illegal sector where the risk of deportation is assumed to be zero, so stricter deportation policies do not affect their decision to immigrate. Further, since immigrants are forced to stay in the illegal sector, smugglers are guaranteed to receive their smuggling fee. As a result, they will be more willing to smuggle people into the destination country, and the supply of smugglers in the market will increase. This results in a higher number of immigrants entering the destination country.

When the risk of deportation decreases, the effect on the flows of immigrants is ambiguous. Lower deportation risk makes it easier for immigrants to transition to the legal sector after immigrating, and as a result, they default on the contract between them and the smuggler that requires them to pay back the cost of immigration. Since there is a smaller likelihood that immigrants will pay off their debts, smugglers are less inclined to smuggle people into the

country. This decreases the supply of smugglers in the market and reduces the quantity of immigrants smuggled. However, immigrants will be more eager to immigrate because of the lower risk. This increases the demand for human smuggling and increases the quantity of immigrants smuggled. There will be ambiguous changes in the total number of immigrants entering the country. In light of these results, stricter deportation policies do not appear to be beneficial to the government of a destination country. Governments seeking to reduce the incidence of illegal immigration should instead focus their immigration enforcement policy on increased border apprehension and higher fines.

This paper seeks to add to the existing literature by determining what factors influence the presence of illegal migrants, both from human trafficking and human smuggling, in a destination country. Conditions in a home country that are correlated with emigration will also be investigated. There are five models examining migration flows from West and North Africa to Europe and from Latin America to the United States to determine the relevant push and pull factors for these regions.

Data and Methodology

The data for this project is obtained from Eurostat, the World Bank, the Frasier Institute, the United Nations, the Mexican Migration Project, and the U.S. Department of Homeland Security along with its subagency U.S. Customs and Border Protection. Eurostat provides data on the labor cost index, the percent of total visas granted to migrants from any African country, and the number of illegal migrants found present in Europe by country of origin. The labor cost index measures the hourly cost of employing labor. It covers wages, salaries, social security contributions, and taxes paid by the employer minus subsidies received by the employer. It is indexed with the reference year 2016. The percent of visas granted to African migrants takes into

account visas granted for refugee status, subsidiary protection status, authorization to stay for humanitarian reasons, and temporary protection. This variable looks at what percent of the total number of these visas is granted to immigrants from African countries. Data is collected from all of the countries in the European Union and the United Kingdom except Croatia and Romania. These two countries have a significant number of missing data points, so they are not included in the model. The Netherlands did not report the number of illegal immigrants from South Sudan in 2009 and 2010, but they reported zero immigrants from this area from 2011-2019, so it was predicted that the number of Southern Sudanese immigrants in the Netherlands in 2009 and 2010 was also zero.

The bulk of the data used for this project comes from the World Bank. Information is collected on GDP (constant 2017 PPP), per capita GDP growth, population growth, the crude birth rate per one thousand people, the adult male mortality rate, life expectancy, the annual inflation rate (GDP deflator), employment to population ratio for ages fifteen and older, the unemployment rate, and personal remittances received in current US\$ as a percentage of GDP. World Bank indexes measuring the control of corruption, political stability, rule of law, and voice and accountability within each country are also taken into account. Control of corruption measures perceptions on the extent to which public officials use their positions in government for private gain. Political stability measures perceptions about the likelihood of political instability and/or politically motivated violence including terrorism. Rule of law concerns perceptions on the quality of the criminal justice system within a country and how well citizens are obeying the law. Voice and accountability measures perceptions on political freedoms held by citizens, including the freedom to elect their government, freedom of speech, freedom of association, and

freedom of the media. Each index is scored between -2.5 to 2.5; higher scores represent more positive outcomes.

The Fraser Institute provides an index on economic freedom in countries around the world. Data is collected on the labor market regulations score for each European country included in the first regression model. The index is scored from one to ten with countries receiving higher scores when they have fewer labor market regulations. The regulations considered include limits on the number of hours worked, severance pay and advance notice for employees who are fired, the minimum wage, the prevalence of centralized collect bargaining, and the length of military conscription (countries received higher scores for shorter conscription periods).

From the U.S. Customs and Border Protection Agency, data is collected on the number of border patrol agents nationwide between 1992 and 2018. The Mexican Migration Project provides data on the cost of coyote services from a sample of 355 immigrants. The Department of Homeland Security provides records on the number of illegal aliens apprehended in the United States from 1925 to 2018, the number of illegal immigrants removed from the United States based on an order of removal from 1892 to 2018, and the number of immigrants granted legal entry to the United States from 1970 to 2018. From the United Nations, data is collected on the rate of intentional homicides in Latin American countries.

The methodology used for this research is ordinary least squares regression (OLS).⁴ The heteroscedastic and autocorrelated consistent standard errors (HAC) are calculated for the models where these issues are present. Accounting for heteroscedasticity and autocorrelation

4. An in-depth explanation of ordinary least squares regression is provided in appendix A.

provides better insight into the significance of the variables in predicting illegal immigration rates.

The first regression examines potential pull factors in the European Union to predict to which countries African immigrants are likely to immigrate using data spanning from 2009 to 2017. It has the following population regression line (PRL):

$$Ill = \beta_0 + \beta_1GDP + \beta_2LCI + \beta_3CORR + \beta_4VISA + \beta_5LMR + \beta_62009 + \beta_72010 + \beta_82011 + \beta_92012 + \beta_{10}2013 + \beta_{11}2014 + \beta_{12}2015 + \beta_{13}2016 + \epsilon$$

The dependent variable (Ill) in this model is the number of illegal African immigrants found present in each European Union country, except Romania and Croatia, and the United Kingdom. The independent variables are GDP (constant in 2010 US\$), the labor cost index (LCI), control of corruption (CORR), the percent of visas granted to African migrants (VISA), and labor market regulations (LMR). Dummy variables are also introduced to control for the variation in the years. The following table explains the expected signs for the variables.

Variable	Expected Sign	Explanation
Number of Illegal African Immigrants Found Present		Dependent Variable
GDP	+	Immigrants are more attracted to affluent countries because they offer better economic opportunities.
Labor cost index	+	Immigrants are attracted to countries with higher wages and salaries.
Control of corruption	-	Countries with better control over corruption are more likely to be able to stop illegal immigration, so they should see fewer illegal immigrants present.

Percent of visas granted to African migrants	+	African migrants are often displaced due to war and persecution. They will likely want to immigrate to countries that are more willing to grant refugee or humanitarian status, so they can be assured that they won't be deported back to their dangerous home countries.
Labor market regulations	Ambiguous	Countries with fewer labor market regulations are more likely to have employers using illegal labor because of the lack of government oversight. However, the lack of regulations also reduces the demand for illegal labor since companies in these countries do not endure high costs for legal labor.

Tests for multicollinearity, heteroscedasticity, and auto-serial correlation reveal that all three are present in the model. GDP and labor cost index are highly correlated, causing multicollinearity in the model. Since the labor cost index is theoretically less important than GDP, it is removed from the model. To account for the heteroscedasticity and auto-serial correlation in the model, the heteroscedastic and autocorrelated consistent standard errors (HAC) are calculated.

The next model discerns what push factors cause West African emigrants to leave their countries. West Africa is examined separately from North Africa because of the varying political atmospheres in the different regions during this time. The time period for these models includes the Arab Spring revolts that occurred in North Africa which is expected to have an impact on emigration trends that differ from West Africa. The West Africa push factors model includes seven West African countries with at least one thousand of their citizens found illegally present in Europe in 2015. The countries are Nigeria, Senegal, Ghana, Cote d'Ivoire, The Gambia, Guinea, and Mali. It has the following PRL:

$$\begin{aligned}
 \text{Ill} = & \beta_0 + \beta_1\text{POPG} + \beta_2\text{GDPG} + \beta_3\text{INF} + \beta_4\text{EMP} + \beta_5\text{POL} + \beta_6\text{FREE} + \beta_7\text{LAW} + \beta_8\text{REMIT} + \\
 & \beta_9\text{MMOR} + \beta_{10}2008 + \beta_{11}2009 + \beta_{12}2010 + \beta_{13}2011 + \beta_{14}2012 + \beta_{15}2013 + \beta_{16}2014 + \beta_{17}2015 + \\
 & \beta_{16}2016 + \beta_{17}2017 + \varepsilon
 \end{aligned}$$

The dependent variable (Ill) is the number of West African immigrants found illegally present in Europe. The independent variables include population growth (POPG), per capita GDP growth (GDPG), inflation (GDP deflator annual percent, denoted as INF), employment to population ratio (EMP), political stability (POL), political freedom (voice and accountability index, denoted as FREE), rule of law (LAW), remittances as a percentage of GDP (REMIT), and the adult male mortality rate per one thousand (MMOR) between 2008 and 2018. Dummy variables are also included to control for the year. The expected signs of these variables are detailed in the following table.

Variable	Expected Sign	Explanation
Number of West Africans found illegally present in Europe		Dependent Variable
Population growth	Ambiguous	Countries experiencing population growth maybe be experiencing an increase in their labor supply which would cause more people to emigrate, or they could be experience more births which would reduce the number of people emigrating.
Per capita GDP growth	-	Countries experiencing per capita GDP growth should have citizens who are economically better off, thus fewer people should be emigrating.
Inflation rate	Ambiguous	High inflation can motivate people to emigrate. However, high inflation also makes it harder for potential emigrants to pay smuggling fees which would reduce emigration in countries with high inflation.
Employment to population ratio	-	When more people are employed, they have less of an incentive to emigrate.

Political stability	-	Political instability can negatively impact the effectiveness of the government which will prompt citizens to emigrate.
Political freedom	Ambiguous	Having few political rights can motivate citizens to migrate to a different country where their voices will be heard. However, fewer political freedoms may also restrict the ability of citizens to emigrate.
Rule of law	-	When the rule of law in a country is strong, citizens feel protected by and are obedient to law enforcement, so they have fewer incentives to emigrate.
Remittances as a percentage of GDP	+	Countries that rely heavily on remittances for income will have more people emigrating because without remittances their families will experience economic disparity.
Male mortality rate	-	Young men make up the bulk of illegal migrants, so if a country has a high male mortality rate, there will be fewer illegal emigrants.

Rule of law has a variance inflation factor of 10.32 and a high correlation with political freedom and political stability. For parsimony, it is removed from the model. HAC standard errors are also calculated for this model.

Following the model for push factors in West Africa, the next model examines push factors in North Africa. The countries included are Morocco, Egypt, Algeria, Sudan, and Tunisia. This regression includes the same independent variables as the West Africa model. The only variation to the PRL is the dependent variable has been changed to the number of North African immigrants found illegally present in Europe. The superfluous variable test reveals per capita GDP growth, the inflation rate, political stability, and remittances to all be insignificant in this model, so they are removed. Per capita GDP growth theoretically is an important push factor for emigration. However, this regression was performed after the West Africa push factors model where per capita GDP growth is determined insignificant. In West Africa, per capita GDP growth is partially insignificant because it did not result in employment growth. Considering that issues with employment and political rights were the main motivators for the Arab Spring

revolts, it made sense that per capita GDP growth would be insignificant in North Africa as well because as seen in West Africa, many African nations struggle with providing job growth to accompany per capita GDP growth, thus rendering per capita GDP insignificant in predicting illegal emigration flows.

For inflation and remittances, there is not a strong theoretical basis for these variables being significant push factors in North Africa specifically. Inflation is meant to measure the health of the economy, but employment is likely a better measure in this context due to the issues North African countries experienced with high unemployment during this time period. The significance of political issues in predicting emigration flows is captured by the rule of law and political freedom variables in this model, which is why the removal of political stability is deemed sound. While heteroscedasticity is not detected, the Durbin-Watson test shows there is auto-serial correlation. Therefore, the HAC standard errors are calculated.

Next, the research focuses on illegal migration patterns between Latin America and the United States. First, pull factors for the United States are explored. The data for this regression is time series spanning from 1970 to 2018. It has the following PRL:

$$I_{it} = \beta_0 + \beta_1 EMP + \beta_2 GDPG + \beta_3 INF + \beta_4 LIFE + \beta_5 UR + \beta_6 IMM + \beta_7 REM + \beta_8 ICE + \varepsilon$$

The dependent variable is the number of illegal immigrants apprehended by the United States government in a given year. The independent variables are the employment to population ratio (EMP), per capita GDP growth (GDPG), the inflation rate (INF), life expectancy (LIFE), the unemployment rate (UR), the number of legal immigrants granted permanent residency (IMM), the number of illegal immigrants removed from the United States lagged by one year (REM), and a dummy variable for the existence of the Immigration and Customs Enforcement agency

(ICE). The dummy variable for ICE is given the value of one if ICE existed during this year and zero if ICE did not exist. The following table outlines the expected signs of these variables.

Variable	Expected Sign	Explanation of variable and sign
Number of illegal immigrants apprehended		Dependent variable
The employment to population ratio	+	Employment is one of the leading pull factors for illegal immigrants. The employment ratio reflects the breadth of job opportunities in the United States and encourages people to immigrate. Therefore, there should be a positive relationship between the employment ratio and illegal immigrants apprehended.
Per capita GDP growth	+	Migrants are attracted to wealthy countries, so when the U.S. is experiencing per capita GDP growth, they should be more illegal migrants entering the country.
Inflation rate	-	Inflation is another symbol of a country's wealth and general economic health. When inflation is rising, the U.S. is experiencing economic woes, so fewer migrants will want to immigrate.
Life expectancy	+	High life expectancy is a sign of health and safety which would attract migrants.
Unemployment rate	-	Immigrants will want to come to the U.S. during a period where unemployment is low, so they can be certain they will find a job. Thus, there should be a negative relationship between unemployment and the number of illegal immigrants apprehended.
Number of legal migrants granted permanent residency	Ambiguous	Individuals are encouraged to move to a country when they see the acceptance of other migrants in the country which would increase the number of illegal immigrants. However, if the U.S. is granting permanent residency to more people, it may eliminate the need for illegal immigration.
Number of illegal migrants deported	-	Immigrants are fearful of deportation, so they are less likely to illegally immigrate when the U.S. is deporting people in higher numbers.

Immigration and
customs enforcement
(ICE)

-

The Immigration and Customs Enforcement agency was created to address the problem of illegal immigration and decrease its prevalence. If this agency is effective, then there should be a negative relationship between its existence and the number of illegal immigrants in the U.S.

The superfluous variable test shows that life expectancy and the inflation rate are superfluous variables, so they are removed from the model. Previous literature has not established life expectancy as a significant predictor of illegal immigration flows. The variable is included in the model to represent the general quality of life in the United States which immigrants may be attracted to, but the results show that it may not be the best representation of the quality of life which is why it is removed. The inflation rate is included with per capita GDP growth, the unemployment rate, and the employment to population ratio as measures of economic prosperity in the United States. However, in theory, per capita GDP growth and employment are considered to be the better indicators of economic prosperity, so it is theoretically sound to remove the inflation rate. The number of illegal immigrants removed from the U.S. is highly insignificant and has the wrong sign, so it is also removed from the model. Auto-serial correlation is present in the model, so the HAC standard errors are calculated. Both the employment to population ratio and unemployment rate are meant to measure the effect employment has on illegal immigration patterns. Therefore, a superfluous variable test is performed to see if the unemployment rate is a redundant variable. In the model without the unemployment rate, the adjusted R^2 is 0.6195, significantly lower than the model including this variable. Further, a formal omitted variable bias test confirms that the unemployment rate would be an omitted variable if removed from the model. Thus, it remains in the model.

The final regression analyzes push factors for illegal migration in Latin America. This model looks at panel data recording the number of illegal immigrants apprehended in the United States from Mexico, Guatemala, Honduras, El Salvador, Brazil, Ecuador, Colombia, and Jamaica from 2009 to 2018.

$$\begin{aligned} \text{III} = & \beta_0 + \beta_1\text{POPG} + \beta_2\text{REMIT} + \beta_3\text{INF} + \beta_4\text{IMM} + \beta_5\text{GDPG} + \beta_6\text{CORR} + \beta_7\text{POL} + \\ & \beta_8\text{FREE} + \beta_9\text{UR} + \beta_{10}\text{HOMI} + \beta_{11}\text{EMP} + \beta_{12}2009 + \beta_{13}2010 + \beta_{14}2011 + \beta_{15}2012 + \\ & \beta_{16}2013 + \beta_{17}2014 + \beta_{18}2015 + \beta_{19}2016 + \beta_{20}2017 + \varepsilon \end{aligned}$$

The dependent variable is the number of illegal immigrants apprehended from the aforementioned countries. The independent variables included in the model are population growth (POPG), personal remittances received as a percentage of GDP (REMIT), the inflation rate (INF), the number of immigrants granted legal entry into the United States (IMM), per capita GDP growth (GDPG), control of corruption (CORR), political stability (POL), political freedom (voice and accountability index, denoted FREE), the unemployment rate (UR), the rate of intentional homicide (HOMI), and the employment to population ratio (EMP). Dummy variables are also included to control for variation in the years. The following table outlines the expected signs for these variables.

Variable	Expected Sign	Explanation
Number of illegal immigrants apprehended		Dependent variable
Population growth	Ambiguous	Countries experiencing population growth maybe be experiencing an increase in their labor supply which would cause more people to emigrate, or they could be experience more births which would reduce the number of people emigrating.

Personal remittances as a percent of GDP	+	There should be more illegal emigrants from countries where remittances make up a large portion of GDP because it is a major source of income for people in that country.
Inflation	Ambiguous	High inflation can motivate people to emigrate. However, high inflation also makes it harder for potential emigrants to pay smuggling fees which would reduce emigration in countries with high inflation.
The number of legal migrants granted permanent residency	+	Countries with larger numbers of immigrants granted permanent residency in the U.S. presumably have a larger demand for emigration, so they should have more illegal migrants leaving than countries with smaller demand for emigration.
Per capita GDP growth	-	When per capita GDP is growing, citizens are becoming wealthier which decreases the need to emigrate.
Control of Corruption (CORR)	-	Governmental corruption can affect the amount and quality of government-provided services, prompting citizens to emigrate.
Political stability (POL)	-	Political instability increases the likelihood of war, endangering the lives of citizens, and reduces the faith people have in their government. This results in more emigration.
Political freedom (voice and accountability index)	Ambiguous	A lack of political freedom can motivate people to emigrate. However, extreme restrictions on freedom can also prevent individuals from having the ability to migrate.
Unemployment rate (UR)	Ambiguous	Unemployment will motivate people to emigrate. However, without employment, potential emigrants may not have enough money to pay smuggling fees.
The rate of intentional homicides (HOM)	+	Violence is one of the most prominent push factors in Latin America. People from countries with high homicide rates should have more people illegally emigrating.
Employment to population ratio	-	When more people are employed, they have less of an incentive to emigrate.

The superfluous variable test shows that the homicide rate is insignificant in the model, so it is removed. Initially, there was reluctance to remove this variable because many immigrants report increases in violence in their home countries as motivation for emigration. However, the threat of violence is recited more often than concerns of the actual rate of homicide, so it is

concluded that this variable may not accurately represent the violence emigrants fear in their home countries and should be removed (United Nations 2020). Political freedom has a variance inflation factor of sixteen, so it is removed from the model to eliminate severe multicollinearity. Heteroscedasticity and auto-serial correlation are present in the model, so the HAC standard errors are calculated.

Results

Europe, West Africa, and North Africa

Regression analysis finds that 69.18 percent of the variation in the number of illegal African migrants found present within a European Union country can be explained by the variation in the labor market regulations, control of corruption, GDP, and the percent of visas granted to African migrants within that country. The F-statistic has a p-value that is essentially zero, so the variables are jointly significant meaning together, they have a significant impact on the number of illegal immigrants present. Labor market regulations, control of corruption, GDP, and the percentage of visas granted to African migrants are all significant at less than one percent in both the OLS and HAC models, meaning they are excellent predictors of how many illegal African immigrants can be expected to be found in a given European country.⁵

Labor market regulations and control of corruption have negative signs indicating that more illegal African migrants will be found in countries with strict regulations and better control over the corruption in their government. In general, illegal activity thrives more in areas with

5. Significance at ten percent is generally considered to be a good predictor, five percent is a great predictor and one percent is the strongest predictor.

strong government corruption due to the breakdown in the rule of law, so the negative correlation between control of corruption and the number of illegal African immigrants found present is consistent with what is expected. Strict labor market regulations on the minimum wage, number of hours people can work, severance pay, etc. increase the cost of employing legal labor, creating a demand for illegal labor, which is not subject to these regulations. In countries with fewer labor market regulations, the cost of legal and illegal labor are more similar which results in smaller demand for illegal labor. The derived demand for illegal labor created by strict labor market regulations provides a possible explanation for the negative correlation between labor market regulations and the number of illegal African immigrants found present in a country.

Consistent with theory, GDP and the percent of visas granted to African immigrants have positive signs. Migrants are generally attracted to wealthy countries, so European countries with high GDPs should have more illegal African migrants present. Further, African migrants gravitating towards European countries where they are likely to receive visas is consistent with what would be expected from an illegal migrant.

Theoretically, labor market regulations, control of corruption, GDP, and the percent of visas granted to African immigrants should all be significant in determining which countries attract higher numbers of illegal African immigrants, so the regression results are sound.

Transitioning from pull factors for illegal immigration, the next two models examine pull factors for West and North African migrants. The OLS regression for West Africa has an adjusted R^2 of 0.7302 and F-statistic with a p-value of nearly zero. Population growth has a positive sign, so West African countries experiencing population growth will see more people illegally immigrating to Europe. However, the significance level for population growth varies greatly between the OLS and HAC models. It is significant at ten percent in the OLS, but only

significant at twenty percent in the HAC model. This is likely due to heteroscedasticity and auto-serial correlation in the OLS model biasing the t-statistics to make the variable appear more significant.

Per capita GDP growth has a similar problem with its significance levels. It is significant at ten percent in the OLS model, but when the model is adjusted for heteroscedasticity and auto-serial correlation, it becomes nearly insignificant. Further, per capita growth has a positive sign meaning that countries experiencing economic growth are also seeing more people emigrating to Europe. This sign appears counter-intuitive at first, but Akeju and Olanipekun (2014) may offer insight into this positive relationship. Their results also lend credibility to the results of the HAC model being more accurate. Akeju and Olanipekun looked at Nigeria, one of the countries included in this model, and examined the relationship between GDP and unemployment. They find that as GDP has been growing in Nigeria so has unemployment. The wealth the nation is amassing is not translating into more jobs for citizens which leaves them with no choice but to migrate. This may explain why per capita GDP is insignificant in the West African push factors model, but the employment to population ratio is significant. In West Africa, there is little difference between the wealthier countries and the more impoverished countries. Both have a large segment of the population that needs employment, and this will drive illegal emigration patterns regardless of variation in per capita GDP growth.

The inflation rate is positively correlated with illegal emigration and significant at ten percent in both models while the employment to population ratio is negatively correlated with illegal emigration and significant at one percent. These results show the significant impact economic disparity has on the decision to emigrate. When inflation is high and job prospects are low, emigration can become the means for survival.

Political stability and political freedom are significant at one percent in both models, but political stability is negatively correlated with illegal emigration while political freedom is positively correlated. Political instability has plagued West African countries for decades motivating emigration while political freedom affords emigrants the ability to leave. Majeed and Malik (2017) also observed higher rates of human trafficking victims originating in more democratic countries, further demonstrating how freedom of movement is crucial to both voluntary and involuntary illegal emigration.

Remittances as a percentage of GDP is positively correlated with illegal emigration but insignificant to the model. When remittances make up a large portion of GDP, this does result in more illegal migrants. However, this is not significant in predicting which West African country will have more illegal migrants entering Europe.

As expected, the adult male mortality rate is negatively correlated with illegal emigration. Men are not living long enough to make the journey to Europe in countries with higher male mortality rates, so they see fewer illegal immigrants present in Europe. However, the significance of this variable is questionable. It is significant at five percent in the OLS model but nearly insignificant in the HAC model. From the data, the male mortality rate is extremely high across the region with an average of 309 deaths per one thousand men, and the variation across the countries is minimal. With high mortality being present in every country, it is likely that the male mortality rate does not play a significant role in predicting which countries will have more illegal migrants in Europe.

Overall, the model shows that employment, inflation, political stability, and political freedom are the most important factors in predicting illegal migration flows from West Africa to Europe. This is consistent with what is expected since unemployment has been a prolonged issue

in many West African nations. There are also multiple developing nations included in the model, so inflation should have been significant since this is a problem facing many developing nations. Civil wars and political strife have plague numerous nations included in this model, so it is expected that political stability would play an important role in determining illegal emigration as well.

The model for North African push factors showed slightly different results. The adjusted R^2 is 0.8036 with a p-value of essentially zero for the F-statistic. Compared to the HAC model, the only variable in the OLS model with a change in significance level is political freedom which is significant at ten percent in the HAC model compared to being significant at one percent in the OLS model.

Population growth is significant at 0.1 percent and negatively correlated with illegal emigration. North African countries are likely experiencing more births instead of more working-age migrants entering the labor force. In this case, the new parents may choose to not emigrate.

The employment to population ratio and rule of law are significant at less than one percent while political freedom is significant at ten percent (based on the HAC model). A positive correlation exists for the employment to population ratio while rule of law and political freedom are negatively correlated with illegal migration from North Africa. These relationships reflect the breakdown in the social contract adopted by many Middle Eastern and North African governments during the 1950s and the decades following it. This social contract promised redistribution of wealth, low taxes, and economic prosperity to citizens in return for fewer political freedoms and a more authoritarian government (Rougier 2016). The governments provided large income transfers to households to reduce the incidence of poverty. However,

government subsidies to producers have been concentrated on industries closely tied to the government. These industries are often inefficient, causing slow economic growth. Further, there is significant underemployment and even unemployment for many young, educated North Africans. This was a catalyst to the Arab Spring protests from 2010 to 2012 where young people fought against their underperforming, authoritarian regimes (Rougier 2016). The plight of these people is reflected in the regression analysis performed in this paper. The regression shows that people who are employed (but probably underemployed), living with relatively little political freedom, and experiencing a breakdown in the rule of law are more likely to illegally emigrate. These young North Africans were facing significant underemployment in their jobs while living under oppressive regimes, multiple waves of political protest, and decay of the rule of law. As a result of the political and economic disarray of their countries, they chose to emigrate.

The male mortality rate is also significant at 0.1 percent and has a negative coefficient. Countries where the male mortality is high have fewer people migrating because the men are not living long enough to migrate. While a growing number of women and children are migrating to Europe, the overwhelming majority of illegal migrants are still adult men, average age twenty-seven (Colucello and Massey 2007).

The results of this model are interesting because of the weight government effectiveness has on illegal emigration. The breakdown in the social contract between the government and the people left North Africans with little hope for their economic future and escape to Europe as their best option.

Table 1. European Union Pull Factors

Variable	OLS – unadjusted standard errors			HAC – adjusted standard errors	
	Coefficient	T-statistic	P-value	T-statistic	P-value
Labor market regulations	-3007	-6.224	2.40e ⁻⁰⁹ ***	-3.0546595	0.0025***
Control of corruption	-1993	-3.276	0.00122***	-3.5506633	0.0005***
GDP	1.007e ⁻⁰⁸	19.773	0.00000***	7.4686592	0.0000***
Percent of visas granted to African migrants	60.29	2.974	0.00327***	2.6488672	0.0087***

Significance codes: ***1%, **5%, *10%

The significance level of an independent variable shows how much of the variation in the dependent variable can be explained by the variation in the independent variable. Significance at one percent is the strongest predictor, five percent is a great predictor and ten percent is good.

Table 2. West Africa Push Factors

Variable	OLS – unadjusted standard errors			HAC – adjusted standard errors	
	Coefficient	T-statistic	P-value	T-statistic	P-value
Population Growth	2902.148	1.733	0.0884*	1.4000	0.1668
Per capita GDP growth	231.683	1.764	0.0829*	1.3128	0.1944
Inflation rate	104.650	1.968	0.0538*	1.9772	0.0528*
Employment to population ratio	-664.578	-10.495	5.02e ⁻¹⁵ ***	-7.4537	0.0000***
Political stability	-5095.833	-8.269	2.17e ⁻¹¹ ***	-4.0580	0.0001***
Political freedom	4350.536	5.265	2.14e ⁻⁰⁶ ***	3.5505	0.0008***
Remittances	96.368	0.610	0.5442	0.3209	0.7494
Male mortality rate	-21.535	-2.516	0.0146**	-1.3023	0.198

Significance codes: ***1%, **5%, *10%

Table 3. North Africa Push Factors

Variable	OLS – unadjusted standard errors			HAC – adjusted standard errors	
	Coefficient	T-statistic	P-value	T-statistic	P-value
Population Growth	-18752.90	-5.583	0.00000197***	-5.8976	0.0000***
Employment to population ratio	2783.09	8.041	8.35e ⁻¹⁰ ***	6.1399	0.0000***
Rule of law	-17012.90	-5.030	0.0000114***	-4.3491	0.0001***
Political freedom	-7119.25	-3.030	0.004322***	-2.0007	0.0524*
Male mortality rate	-149.36	-8.309	3.68e ⁻¹⁰ ***	-6.5797	0.0000***
2008	-7731.04	-2.261	0.029390**	-2.6057	0.0129***
2009	-7756.50	-2.309	0.0266322**	-2.2981	0.0270***
2010	-8720.20	-2.623	0.012381**	-2.3031	0.0267***

Significance codes: ***1%, **5%, *10%

United States and Latin America

The next model examines the characteristics of the United States that influence migrants' decision to illegally immigrate. The adjusted R^2 in this model is 0.7686 which is a good fit for the model. This means 76.86 percent of the variation in the number of illegal immigrants apprehended in the United States can be explained by the variation in the employment rate, GDP growth rate, unemployment rate, number of legal immigrants granted permanent residency, and the existence of the Immigration and Customs Enforcement agency. The variables are jointly significant with the p-value of the F-statistic being essentially zero meaning that together they are significant in predicting the number of illegal immigrants present in the United States.

The employment to population ratio is significant at one percent in both models and positively correlated with illegal migration. When employment is rising in the United States, it

sends a sign that there are more jobs available, so more people are incentivized to immigrate. However, the unemployment rate is also significant at one percent and positively correlated with illegal immigration. This positive correlation is unexpected as rising unemployment should not motivate people to enter the United States. Further, unemployment in Mexico, Guatemala, El Salvador, and Honduras, the countries with the highest number of illegal immigrants residing in the United States, is consistently lower than unemployment in the United States. Thus, it does not follow that people from these countries would want to immigrate to a country where unemployment is worse.

However, table six shows that frictional unemployment seems to be a larger problem in Mexico, El Salvador, and Honduras. This table shows the average unemployment rate for people with advanced degrees from 2010 to 2019 for the United States, Mexico, El Salvador, and Honduras. Guatemala is not included due to inconsistent data. The table shows a higher average unemployment rate for people with advanced degrees in Latin American countries than in the United States. It seems frictional unemployment stemming from a mismatch of jobs and skills is driving illegal migration from Latin America to the United States. Thus, even when unemployment is high in the United States, frictional unemployment in Mexico, Honduras, and El Salvador will still motivate people to emigrate.

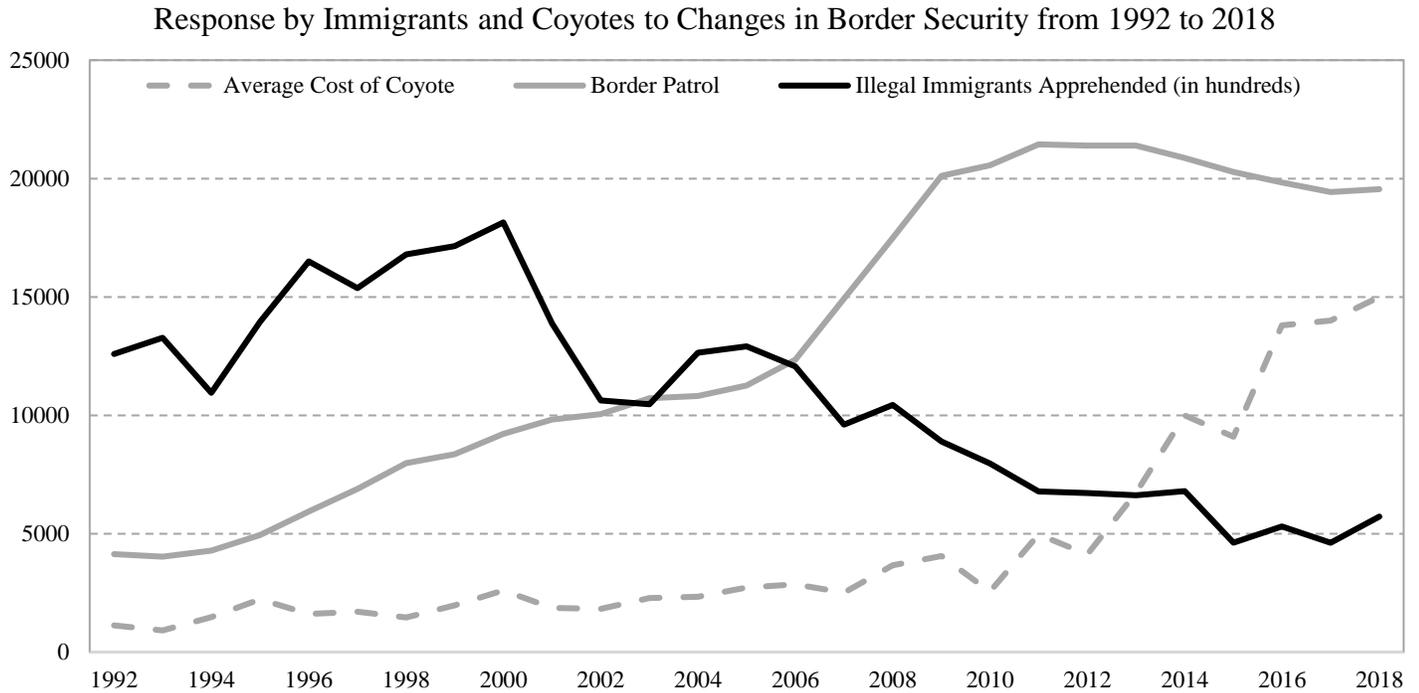
Per capita GDP growth is also positively correlated with illegal immigration, so when the United States is experiencing economic prosperity, more migrants illegally enter the country. Per capita GDP growth is significant at ten percent in the OLS model, but significant at five in the HAC model. While it is unclear exactly at which level per capita GDP is significant, both models confirm that this is a significant factor in determining illegal immigration flows to the United States.

The number of legal immigrants granted permanent residency and the existence of ICE are negatively correlated with illegal immigration to the United States. These results suggest that creating more legal means of immigration and strictly enforcing immigration laws reduce the presence of illegal immigrants in the United States. Both of these variables are significant in the OLS and HAC models.

In the literature review, Tamura (2013) postulates increasing border security will raise smuggling prices enough to deter immigration. Gathmann (2008) examines this claim within the time frame of 1972 to 2003. To provide more updated results, this paper looks at the correlation between the average cost of a coyote, the number of United States border patrol agents, and the number of illegal immigrants apprehended between 1992 and 2018. As the graph below shows, the average cost of a coyote tends to trend positively with the number of border patrol agents in the United States nationwide, so that as the United States increases the size of its border patrol, coyote prices increase. This rise in prices could reflect the increase in the risk to smugglers who now face a higher probability of being caught by authorities. Alternatively, the rise in prices may reflect smugglers increasing fees for travel through undetected routes as border patrol agents uncover more popular migration routes.

Further, starting in 2006, the number of illegal immigrants apprehended trends in the opposite direction of border security and the cost of a coyote, suggesting immigrants do respond to rising coyote fees and border patrol by reducing the number of people illegally entering the United States. Without controlling for confounding variables, the correlation between the number of illegal immigrants apprehended and the number of border control agents is -0.83 while the correlation between the number of illegal immigrants apprehended and coyote fees is -

0.74. These results provide evidence to support Tamura's argument that increasing border patrol can help reduce the number of people illegally immigration to the United States.



Overall, the results show that per capita GDP growth and employment opportunities serve as pull factors, encouraging people to enter the United States. However, people being granted legal entry and ICE all act to reduce illegal immigration. Further, increasing border security may also help reduce the number of people illegally immigrating.

The final model for this paper examines push factors for Latin American emigrants. The adjusted R^2 is 0.8377. The F-statistic has a p-value that is nearly zero, so the variables are jointly significant. Population growth is significant at one percent in both models and positively

correlated with illegal emigration. Latin American countries experiencing population growth are more likely to have high numbers of illegal migrants traveling to the United States.

Personal remittances received as a percent of GDP is positively correlated with illegal emigration. Countries that rely heavily on remittances for GDP have larger numbers of illegal migrants entering the United States because citizens in these countries depend on remittances for income. The variable is significant at one percent in the OLS model, but only at ten percent in the HAC model. While the significance levels vary between models, the results ultimately conclude that personal remittances as a percent of GDP is a significant factor in predicting illegal emigration flows from Latin America to the United States.

Per capita GDP and inflation are significant in both models and are negatively correlated with illegal emigration. When per capita GDP is growing, citizens are expected to be generally wealthier, reducing their need to migrate. When inflation rises, this makes them poorer, motivating them to migrate. However, higher inflation makes it more difficult for them to afford smuggling fees, so despite their desire to emigrate, they do not possess the means to emigrate.

The number of legal immigrants granted permanent residency is significant at one percent in both models and positively correlated with illegal emigration. Countries with higher numbers of migrants entering the United States legally also have more emigrants entering the United States illegally. Chain migration plays a role in this pattern. Mexico, in particular, has been the largest source of legal immigrants in the United States for nearly half of the 20th century. The vast majority of Mexican immigrants obtain legal permanent residency through chain migration when family members living in the United States apply for family unification. Similarly, economic downturns and violence in Peru, Colombia, and Ecuador during the 1980s and 1990s sparked legal chain migration patterns. For every one hundred legal migrants, more than five

hundred visas for family members were filed (Tienda 2017, 743). However, there is a limit on the annual number of family visas granted to legal permanent residents which creates a demand for chain migration through illegal means. When legal permanent residents are not able to bring their family members to the United States through legal means, they can turn to illegal migration as a way to be reunited with their families.

Control of corruption is positively correlated with illegal emigration from Latin America to the United States. This is an unexpected result; however, Merkle et al. (2017) provide an explanation for this positive correlation. Their study finds that international migration has a negative effect on corruption in a home country. When migrants travel to less corrupt countries and receive better tertiary educations, they become more vocal about corruption in their home country. They encourage their friends and family in the home country to not participate in the corrupt systems and to support political parties fighting against corruption. This puts pressure on governments in the home country to address corruption in their political systems, resulting in better control over corruption. This could explain why there is a positive relationship between the number of illegal immigrants apprehended and the control of corruption. As more migrants from a particular country enter the United States, they put more pressure on their home countries to address corruption, resulting in a better score on the control of corruption index. In this case, the number of illegal emigrants is acting to influence control of corruption, and thus, the control of corruption variable does not aid in determining what factors push people to illegally emigrate to the United States. This variable is significant at one percent in the OLS model and significant at ten percent in the HAC model.

The employment to population ratio is negatively correlated to illegal migration. As expected, countries with more people employed have fewer people illegally emigrating to the

United States. This variable is significant at five percent in the OLS model and at one percent HAC model.

The results of the model show that a variety of financial and non-financial factors influence illegal migration from Latin America to the United States. Population growth and legal emigration to the United States encourage citizens in Latin America to emigrate illegally. Further, small or negative per capita GDP growth, small employment to population ratios, and a reliance on remittances for GDP also drive people to emigrate illegally. However, inflation can act to hinder illegal emigration by preventing migrants from being able to afford human smuggling fees. Interestingly, the results also suggest that illegal emigration may be improving corruption in Latin American countries. However, further research will need to be conducted to confirm this theory.

Table 4. United States Pull Factors

Variable	OLS – unadjusted standard errors			HAC – adjusted standard errors	
	Coefficient	T-statistic	P-value	T-statistic	P-value
Employment to population ratio	163300	10.035	7.76e ⁻¹³ ***	9.227	0.0000***
Per capita GDP growth	28140	1.948	0.05802*	2.4009	0.0208**
Unemployment rate	113500	5.420	2.54e ⁻⁰⁶ ***	7.026	0.0000***
Number of legal migrants	-0.2551	-2.146	0.03759**	-3.3896	0.0015***
Immigration and Customs Enforcement	-189200	-2.776	0.00812***	-3.8554	0.0004***

Significance codes: ***1%, **5%, *10%

The significance level of an independent variable shows how much of the variation in the dependent variable can be explained by the variation in the independent variable. Significance at one percent is the strongest predictor, five percent is a great predictor and ten percent is good.

Table 5. Latin America Push Factors

Variable	OLS– unadjusted standard errors			HAC – adjusted standard errors	
	Coefficient	T-statistic	P-value	T-statistic	P-value
Population growth	147800	5.632	4.81e ⁻⁰⁷ ***	2.804	0.0068***
Personal remittances as a percent of GDP	3371	2.706	0.00883***	1.944	0.0566*
Inflation	-11080	-3.257	0.00184***	-1.677	0.0986*
The number of legal migrants granted permanent residency	2.789	14.480	0.00000***	7.884	0.0000***
Per capita GDP growth	-7856	-1.782	0.07979*	-1.688	0.0964*
Control of Corruption	245700	4.993	5.27e ⁻⁰⁶ ***	2.209	0.0309**
Political stability	-13700	-0.634	0.52843	-0.864	0.3909
Unemployment rate	-4351	-1.352	0.18147	-1.179	0.2431
Employment to population ratio	-9805	-2.386	0.02016**	-2.707	0.0088***

Significance codes: ***1%, **5%, *10%

Table 6. Unemployment in the Americas from 2010-2019

Country	Average Unemployment Rate	Average Unemployment Rate with Advance Degree
El Salvador	4.17	4.91
Honduras	5.47	6.88
Mexico	4.34	4.91
Guatemala	2.74	-
United States	6.23	3.68

Conclusion

The results show that a combination of political, economic, and social factors motivate people to emigrate from Latin America, West Africa, and North Africa. Similarly, government policies and appealing economic conditions in the United States and the European Union pull people to these regions.

Government Policy and Political Push and Pull Factors

It appears that more lenient legal immigration policies can influence illegal migration. When European countries or the United States showed more willingness to grant legal visas to citizens from certain countries, they also saw more illegal immigrants entering from those countries. In the European Union pull factors model, illegal African immigrants are shown to be more attracted to countries granting a larger percentage of visas to Africans. In the Latin American push factors model, we see that countries with more people emigrating legally are more likely to experience a higher incidence of illegal emigration. However, these trends may not solely be due to friendly government policies. In Latin America, chain migration has become a popular method of entry to the United States. The prevalence of chain migration calls into question the efficacy of any changes to visa policies. As Table A.1 in appendix B shows, the United States grants very few affirmative and defensive visas for illegal immigrants who are already in the United States. Even without the prospect of obtaining a visa, immigrants continue to enter the United States, suggesting they would not be very responsive to stricter visa policies. Germany, France, and Greece host some of the largest numbers of illegal African immigrants. Tables A.2 and A.3 show that they grant a small percentage of those immigrants visas as well, yet they still receive tens of thousands of illegal immigrants each year. These figures suggest that

instead of restricting legal visas, the United States and the European Union will need to explore other policy options when trying to reduce the incidence of illegal immigration.

Poor institutions in the country of origin are also major factors in illegal emigration. Political instability in West Africa is pushing people to emigrate. In North Africa, a decline in the rule of law and prolonged limited political freedom are also pushing people to emigrate. Meanwhile, in Latin America, the results suggest that illegal migration may be acting to reduce corruption in the government. This supports research conducted by Merkle et al. (2017) which showed that international migration puts pressure on governments in the home countries to reduce corruption. There is currently limited research on the connection between illegal emigration and corruption, so this would be a point of interest for future research. In contrast, the European Union pull factors model shows that countries with more corruption are more likely to be the destination of illegal immigration. In addition, European governments who impose strict labor market regulations make illegal immigrant labor more attractive to employers which pulls immigrants to these countries.

Economic Push and Pull Factors

The models for pull factors in Europe and the United States confirm that GDP is a significant driver of illegal immigration. As the European Union model shows, illegal immigrants are attracted to countries with higher GDP. Since the United States is not being compared with other countries, per capita GDP growth is used instead of GDP alone to determine how changes in GDP possibly influenced the behavior of immigrants. In the United States, more illegal immigrants arrive during periods of high per capita GDP growth. Consistent with theory, immigrants are attracted to economic prosperity. They gravitate towards more

wealthy European countries and are more attracted to the United States when it is experiencing economic growth.

Per capita GDP growth is negatively correlated with illegal emigration in Latin America and North Africa, but positively correlated with illegal migration in West Africa. However, it only plays a significant role in predicting illegal emigration patterns in Latin America. This may be a result of the fact that per capita GDP growth does not help improve the financial standing of citizens in West Africa. As Akeju and Olanipekun (2014) found in Nigeria, while GDP has been growing, so has unemployment in Nigeria. The wealth being amassed in the country is not being equitably dispersed within Nigeria, leaving many poor people with little hope for change in their financial future and with migration as their only option for economic success. In North Africa, government failure has slowed economic growth, rendering per capita GDP growth irrelevant to potential migrants who've seen very little change in per capita GDP.

Meanwhile, when Latin American countries experience per capita GDP growth, this wealth seems to be better distributed to the poor, disincentivizing citizens to emigrate. If the governments in West and North Africa work towards better distribution of wealth, they may see similar results to Latin America.

Inflation is significant only in West Africa and Latin America. In West Africa, it is positively correlated with illegal emigration demonstrating how inflation is driving people out of the region. In contrast, inflation is negatively correlated with illegal emigration in Latin America which may be explained by potential migrants not being able to afford smuggling fees. This difference is interesting and may be a point of concern for future research on global illegal emigration trends.

The employment to population ratio is significant in all three models. However, while it has a negative correlation in West Africa and Latin America, it has a positive correlation in North Africa. In West Africa and Latin America, smaller ratios of the population being employed are pushing people to migrate. Therefore, government policies aimed at increasing employment should aid in reducing illegal emigration patterns. In North Africa, the results show that higher employment to population ratios encourage illegal emigration instead of reducing it. This is probably explained by the high underemployment in North Africa. While citizens have jobs, these jobs are far below their skill level. Underemployment is likely a consequence of the poor institutional quality that exists within these countries. During the Arab Spring Protests, one of the complaints protestors had about their underperforming government was the lack of jobs for skilled workers. This, coupled with complaints about the authoritarian government, suggests that overall poor institutional quality is the main driver of emigration.

Remittances are only significant in determining illegal emigration patterns in Latin America. In this region, countries that rely more heavily on remittances for GDP have more people illegally emigrating. It is interesting that remittances were not significant in West Africa because remittances are a major source of income in this region. Nigeria, one of the countries included in the West Africa model, is the sixth-largest receiver of remittances in the world, so it is expected that remittances would be important in determining illegal emigration in West Africa (Ohonba and Agbontaen-Eghafona 2019). The insignificance of remittances as a percentage of GDP may be explained by the insignificance of GDP in general. As the models show, GDP is insignificant in predicting illegal emigration flows from West and North Africa to Europe, so the variation in the countries that rely on remittances for GDP would also be insignificant.

Social Push and Pull Factors

There are social factors that also play a role in predicting illegal migration patterns. Population growth is significant in West Africa, North Africa, and Latin America. However, it is only positively correlated with illegal emigration in West Africa and Latin America. These regions followed the pattern identified by Hanson (2006) and Hatton and Williamson (2003) which found that as the population grows in a country, there will be more people illegally migrating out of that country. However, Northern Africa followed the pattern observed by Bohra-Mishra and Massey (2011) which found that an increase in household size reduces the odds of international migration. Given the negative correlation between population growth and emigration, it may be that population growth in North Africa can be attributed more to increases in household size rather than increases in the labor supply.

In Latin America, gang violence has repeatedly been cited by researchers as a significant push factor (Nyczak 2016; Cabot 2014). In the Latin America push factors model, the rate of intentional homicide is insignificant in predicting illegal migration flows; this contradicts the prevailing theory. For future research, violence in Latin America should be investigated to determine if it is truly significant.

Summary

Overall, the models suggest that illegal emigration in Latin America is driven heavily by financial factors. Remittances, per capita GDP growth, and employment all have significant roles in determining illegal migration from Latin America to the United States. Meanwhile, illegal emigration in North Africa appears to be more driven by political factors. Rule of law and political freedom play a significant role in predicting illegal immigration to Europe. Illegal

emigration in West Africa is driven by a combination of financial and political factors, with inflation, employment, and political stability all being important push factors.

GDP, employment, and institutional quality are the factors that appeared to have the most weight across all of the models. In Europe and the United States, good GDP performance is correlated with more illegal immigrants entering a country. In Latin America, low per capita GDP growth is also correlated with more people emigrating from a country. Overall, the results show that illegal migration patterns can be predicted (though not with complete certainty) by examining changes in GDP in various nations.

Employment is another economic factor that is significant across various models. The struggle to find satisfactory employment is shared by Latin Americans, West Africans, and North Africans, demonstrating the significance of this variable. Lackluster employment prospects are a problem shared by many emigrants and to properly address the issue of illegal migration, it will need to be addressed. Further, employment is not just a push factor but also a pull factor. Good employment prospects in the United States are correlated with more illegal immigration. Labor shortages and restrictive labor market regulations that increase the relative price of legal labor serve as catalysts for illegal immigration in Europe. As long as there is a continued demand for illegal labor and migrants willing to supply it, market forces will continue to bolster the practice of illegal migration.

Lastly, institutional quality plays a relatively significant role in both illegal immigration and emigration. Poor institutions in the home country give emigrants a motive to leave. In North Africa, ineffective governments that are characterized by limited political freedom for citizens and weak rule of law are more likely to face emigration. Similarly in West Africa, governments that are plagued with political instability face a higher probability of emigration. While the

results of this paper are less clear about the impact of institutional quality on illegal emigration in Latin America, recent reports from migrants about the rising presence of gangs in Latin American countries suggest these institutions also leave something to be desired. As Suárez et al. (2016), Nyczak (2016), and Cook Heffron (2019) argue, El Salvador, Guatemala and Honduras have become three of the most dangerous countries in the world over the past couple of decades. Moreover, citizens in these countries lack confidence in their justice system to properly address the dangers they are facing, calling attention to a flaw within the governing institutions in Latin America. As the results of this model and previous literature suggest, weak institutions can serve as strong push factors in illegal emigration.

Further, institutional quality also matters in the destination country. In Europe, countries that possessed more corrupt government officials also have higher chances of experiencing illegal immigration. A breakdown in government quality makes it easier for illegal activity to thrive in a country. Conversely, strengthening institutions are shown to reduce illegal immigration. The existence of the Immigration and Customs Enforcement agency, meant to intensify the United States' defense against illegal immigration, is correlated with a decline in the number of illegal immigrants found present in the United States. A final note about the impact of government policies and institutions on immigration is that there can be indirect effects of certain laws. Specifically, labor market regulations can have the indirect effect of increasing illegal immigration. As shown in the Europe pull factors model, countries with stricter regulations also have higher chances of having illegal immigrants present. This could be the result of the regulation increasing the cost of legal labor, through minimum wage laws and limits on the number of hours individuals can work, and therefore increasing the attractiveness of illegal labor to companies.

Future Research

This thesis contributes more insight into what is driving illegal immigration in Europe and the United States. Previous economic literature on the topic of illegal immigration has been mainly theoretical. Few researchers have conducted empirical analysis of the topic to identify the issues that policy makers should specifically focus on when addressing illegal immigration. While other social scientists have identified significant push and pull factors, many are identified through qualitative research. This paper offers a quantitative approach to provide empirical evidence as to the significance of previously identified push and pull factors. Additionally, it highlights the similarities and differences in what motivates emigration around the world. As the results of this paper highlight, the first step to addressing illegal immigration is improving the governing institutions within the countries from which many immigrants originate. Once stable institutions are established, policy makers can then focus on improving employment opportunities for citizens. Finally, they should focus on drivers for emigration that are specific to their region, such as inflation in West Africa and population growth in Latin America. Further, this paper contributes to the ongoing conversation about poverty within the field of economics. Some economists argue that promoting GDP growth should be the focus of public policy in developing nations. However, as this research highlights, GDP growth does not always address the income equality that exists within developing nations. Without measures that adequately improve economic conditions for the poor in particular, emigration rates will continue to rise regardless of GDP performance in developing nations.

There were various limitations in the data available which hindered the completion of this thesis. Wages have been cited as a significant factor in migration patterns, but reliable, consistent data on wages could not be found for the models created in this paper. This would be an

important variable to include in future research. Climate change and gang violence in Latin America are also important push factors to be examined by future research. Moreover, the Latin America push factors model shows that when more people legally emigrate out of a country, this is correlated with more people illegally immigrating as well. Part of this can be explained by chain migration patterns, but future researchers should also look at how general diaspora patterns influence this result. Finally, some scholars have challenged the narrative that human smugglers are acting to protect their migrants. Slack and Campbell (2016) theorize about the influence of drug trafficking organizations in Latin America and present an argument about coyotes being forced to traffic drugs and switch from safely transporting migrants to abusing them. Examining the potential change in the business practices of human smugglers would be an important point for future research.

In addition, missing immigration data from the United States and European Union limited the number of years that could be observed in the models. Finally, the project was completed using the statistical software “R”, and the code used to calculate the HAC standard errors returned results that did not include a new adjusted R squared. Thus, while the results show the heteroscedastic and auto-correlated standard errors for each model, they do not show what the true adjusted R^2 would be without heteroscedasticity and auto-serial correlation. As a result, the goodness of fit measures may be slightly skewed. Nevertheless, the models exhibited fairly strong predictive capabilities.

Initially, the research intended to discern how push and pull factors influence the prevalence of human trafficking in Europe and the United States. However, due to the illegal nature of human trafficking, there is little data available for analysis. As more social scientists

become interested in this issue, data collection will hopefully improve and allow for better analysis of the push and pull factors that contribute to human trafficking in particular.

Appendix A

Ordinary least squares regression seeks to determine the amount of the variation in the dependent variable that can be explained by the variation in the independent variable. This is mainly measured by examining the adjusted R^2 and t-statistics of the independent variables. The adjusted R^2 is a percent given that states the correlation between the independent and dependent variables, weighing the number of independent variables included in the model. The t-statistics determine how significant each independent variable is when predicting the dependent variable. Higher t-statistics are related to lower p-values which means the variables are more significant. In general, variables should have a p-value of 0.20 or lower to be considered significant in a model.

As a part of OLS regression, tests for joint significance, superfluous variables, omitted variable bias, multicollinearity, heteroscedasticity, and auto-serial correlation are completed on each model. To test for joint significance, the F-statistic in a model is examined. If the p-value for the F-statistic is less than 0.05, the variables are deemed to be jointly significant meaning that together they have a significant impact on the dependent variable. Superfluous variables are variables that are not relevant in determining the dependent variable. When a superfluous variable is present in a model, it tends to lower the adjusted R^2 making the model a worse predictor for the dependent variable. In addition, the presence of a superfluous variable can decrease the t-scores of the other variables in the model and make them appear less significant than they truly are to the model. Omitted variables are significant variables that have been left out of the model. When an omitted variable is left out of the model, the adjusted R^2 decreases, and the variables included in the model will have higher t-statistics, making them appear more

significant than they truly are to the model. The omitted variable ends up in the error term of the model, so the standard error of the regression increases.

Multicollinearity is a measure of how correlated the independent variables are with each other. When there is extremely severe or perfect multicollinearity in a model, there are at least two independent variables that are essentially the same thing. They are so highly correlated that including both variables is redundant, so when severe multicollinearity is in a model, one of the variables is usually removed.

Heteroscedasticity is the measure of how the independent variables are correlated with the error terms. In OLS regression, we assume there is homoscedasticity in a model which means there is no correlation between the independent variables and the error terms. If this assumption does not hold, the Gauss Markov Theorem is violated, and the results of the regression are not deemed to be the best, linear unbiased estimators of the dependent variable. When heteroscedasticity is in a model, the standard errors of the independent variables will be incorrect as well as the t-statistics.

Auto-serial correlation occurs in time series data when the error terms are correlated with one another. This means the error term for year X will depend on the error term for year X-1. This makes the standard errors and t-statistics unreliable as well. To correct for auto-serial correlation and heteroscedasticity in a model, the heteroscedastic and autocorrelated corrected standard errors (HAC) are calculated for each model. This reveals the true standard errors and t-statistics for the variables.

Appendix B

Table A1. U.S. Asylum Visas Granted to Illegal Migrants from 2009 to 2018

Country of Origin	Total Number of Illegal Migrants Apprehended	Total Number of Defensive Asylum Visas	Ratio of Defensive Asylum Visas to Migrants	Total Number of Affirmative Asylum Visas	Ratio of Affirmative Asylum Visas to Migrants
Brazil	28088	126	0.45%	421	1.5%
Colombia	20239	1121	5.54%	2799	13.83%
Ecuador	39187	370	0.94%	415	1.06%
El Salvador	486832	5112	1.05%	7380	1.52%
Guatemala	712497	3915	0.55%	8101	1.14%
Honduras	573408	3544	0.62%	4365	0.76%
Jamaica	19956	69	0.35%	462	2.32%
Mexico	4130689	2414	0.06%	3792	0.09%

Table A2. European Visas Granted to Illegal West African Migrants from 2009 to 2018

Country	Total Number of Illegal Migrants Found	Total Number of Visas Granted	Ratio of Visas to Illegal Migrants
Germany	88700	2060	0.02322
France	70205	6655	0.09479
Greece	11520	1160	0.10069

Table A3. European Visas Granted to Illegal North African Migrants from 2009 to 2018

Country	Total Number of Illegal Migrants Found	Total Number of Visas Granted	Ratio of Visas to Illegal Migrants
Germany	68330	1235	0.01807
France	243920	5475	0.02245
Greece	49675	605	0.01218

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