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NATIONAL DEFENSE UNIVERSITY

JOINT FORCES STAFF COLLEGE

JOINT ADVANCED WARFIGHTING SCHOOL



Using Maslow's Hierarchy of Needs to Identify Indicators of Potential Mass Migration Events

by

Reginald Johnson

Commander, United States Navy

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by

Reginald Johnson

Commander, United States Navy

A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

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23 March, 2016

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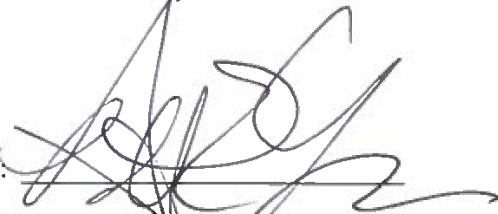
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Director, Joint Advanced Warfighting School

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ABSTRACT

Migrant movement is based on a desire to satisfy human needs. Migrants feel that they have a better chance of satisfying their needs at a different location than their current one. Mass migration events involve large numbers of people making this same determination near simultaneously.

Analyzing historic mass migration events enables the identification of real world conditions that negatively impact the ability of large numbers of individuals to satisfy their needs. Those conditions and the political, social, and economic environment surrounding them affect the characteristics of mass migration events. Identifying those events and environmental factors in past events allows one to search for those same events and factors in the current environment. Finding them leads to the ability to anticipate mass migration events and their characteristics before they happen. The ability to anticipate these events can mitigate loss of life, improve security, and result in more efficient resource usage.

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DEDICATION

I would like to dedicate this work to my family whose patience and support have been critically important throughout my career.

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Mr. Jeffrey Turner

I would also like to thank all those that gather, sift, collate, and publish data and statistics in an attempt to promote a clearer and fact based understanding of our world.

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Chapter 1: Introduction

Europe is in the midst of dealing with a mass migration crisis larger than any seen since World War II.¹ It is estimated that over one million migrants from Africa, Eastern Europe, the Middle East, and Asia entered Western Europe in 2015.² The fact that this number does not include those who have successfully entered Europe undetected means that the number of migrants is actually higher. This human tide shows no sign of abating as the various factors that made these migrants leave their country for the opportunity to have a better life in the west persist.

Leaders in various European Union (EU) nations express concerns about the capital costs of social sector spending related to refugees along with the internal political costs of integrating them into western societies. Described by the German Chancellor as “the next major European project,” EU nations must create and finance a system to process, house, and integrate migrants into society.³ Additionally, they must separate true asylum seekers from migrant workers in order to provide a social safety net for the former while repatriating the latter. Finally, large migration waves present security problems since it is difficult to intercept and perform background checks for each arrival.

Mass migration is hardly just a European concern. The United States also faced mass migrations multiple times over the past 30 years. The US responded to three mass migration

¹ “France and Germany Urge Unified EU Response to Refugee Crisis”, European Union, http://eeas.europa.eu/delegations/new_zealand/press_corner/all_news/news/2015/27august_france_germany_migration_en.htm, (Accessed October 29, 2015).

² “Migrant crisis: Migration to Europe Explained in Graphics”, BBC News, <http://www.bbc.co.uk/news/world-europe-34131911>, January 28th, 2016, (Accessed February 11, 2016).

³ “Merkel: European Solution Needed”, The German Federal Government, http://www.bundesregierung.de/Content/EN/Artikel/2015/08_en/2015-08-14-fluechtlinge_2_en.html, (Accessed October 29, 2015).

events in the Caribbean Sea, and each event required the involvement of US Coast Guard assets for interdiction and rescue. In addition to deploying Coast Guard assets, resources from all branches of the military and multiple civilian agencies augmented the response by providing additional air and sea assets, immigration and customs enforcement, social services, and security.⁴

Mitigation of the significant negative consequences of mass migration; loss of life, illegal immigration, security issues, and strained social services, requires that a large response capacity be available in order to handle potential events. However, constantly maintaining this capacity at a high state of readiness for relatively infrequent events is costly and inefficient. Knowing of and having the ability to observe multiple leading indicators of a mass migration event can result in a more optimal solution. The ability to anticipate a potential mass migration event would allow a country to maintain a less strenuous state of readiness coupled with the capacity to surge response capability. Furthermore, being able to predict characteristics such as size, migrant routes, and origin country could be used to create a more efficient response. In fact, predictive capability might give assisting countries enough warning that they might be able to apply preventive measures to deter the migration in the first place.

The thesis of this paper is that examining commonalities of historic and ongoing mass migration events could result in a framework capable of providing forewarning of future mass migration events and their characteristics. In presenting the proposed framework, this paper

⁴ Alex Larzellere, *The 1980 Cuban Boatlift*, (Washington D.C.: National Defense University Press, 1988), 204-207, 327-337, 347. The need for Joint and interagency cooperation was demonstrated during the Cuban boatlift. The US Navy contributed numerous aircraft as well as the USS Saipan (LHA-2), USS Boulder (LST-1190), USS Ponce (LPD-15) and USS Saginaw (LST-1188) at various times during the crisis. Additionally, multiple Florida National Guard Units and Marines from Camp Lejeune, North Carolina provided security and support. In all, 12 different departments and agencies participated in the response task force.

will first clarify some of the terms associated with mass migration events. Next, it will present a description of the motivation of mass migration participants using Maslow's hierarchy of needs as a framework. Then, historic mass migration events will be examined to connect the previously proposed motivations to real life situations. Finally, leading indicators will be identified in order provide insight into the presence of factors conducive to a mass migration event. Successful completion of this process will facilitate the ability to proactively address migration events in a more efficient and effective manner.

Chapter 2: Background

The United Nations High Commission for Refugees (UNHCR) was established in 1950 as the United Nations' action arm for solving worldwide refugee problems.¹ The UNHCR defines a refugee as a person fleeing armed conflict or persecution. A refugee is distinguished from a migrant who chooses to move "...not because of a direct threat of persecution or death, but mainly to improve their lives by finding work, or in some cases for education, family reunion, or other reasons."² More specifically, the United Nations 1951 Refugee Convention defines a refugee as a person who

...owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it.³

For practical purposes this means a migrant chooses to leave their home country, has the ability to safely go back, and may decide to do so of their own free will. However, a refugee has no such option.⁴ Therefore, while both migrants and refugees migrate, not all migrants are refugees. This means that a mass migration can consist of both refugees and migrants. As such, these terms are used interchangeably to describe participants in a mass migration, and are used more specifically when the migrants' intentions are known.

Unfortunately, the UNCHR is not as clear on the meaning of the adjective "mass" when attached to the term migration. The massiveness of a migration is often in the eye of the

¹ "About Us", United Nations High Commission for Refugees, <http://www.unhcr.org/pages/49c3646c2.html>, (Accessed September 28, 2015).

² "UNHCR Viewpoint: 'Refugee' or 'Migrant'", United Nations High Commission for Refugees, <http://www.unhcr.org/55df0e556.html>, (Accessed September 28, 2015).

³ United Nations, "Convention and Protocol Relating to the Status of Refugees", Text of the 1951 Convention Relating to the Status of Refugees, 14.

⁴ "UNHCR Viewpoint: 'Refugee' or 'Migrant'", United Nations High Commission for Refugees.

destination. A large, open, and willing country such as the US during the 19th century would not necessarily consider a large migration problematic, while a small country with limited resources might consider even a few hundred immigrants a grave problem. Massiveness can also be viewed as a matter of rate. For example, a small but steady stream of migrants may add up to a large number over time; however, the extended duration may provide enough time for the destination country to integrate those migrants. On the other hand, the same amount of migrants over a shorter time period may inundate the destination country. This ambiguity of “mass” cannot be eliminated, but it can be mitigated by examining migrations labeled as “massive” and determining the number of refugees per month to use as a rate. Calculating the number of migrants per month of previously identified mass migrations will provide a threshold for finding other mass migration events to examine and compare.

Putting Migration into Perspective

The United States Coast Guard is the lead agency for the interdiction of migrants entering the United States via the seas. It identified three mass migration events involving migrants from Cuba and Haiti attempting to enter the United States:

- Operation ABLE MANNER: 25,177 Haitian migrants from 15 January 1993 to 26 November 1994, 9 deaths, 5 births ⁵
- Operation ABLE VIGIL: 30,224 Cuban migrants from August 1994 to September 1994 ⁶
- Mariel Boatlift: 124,776 Cuban migrants from 01 April 1980 to 25 September 1980, 27 deaths ⁷

⁵ “Alien Migrant Interdiction: Operation ABLE MANNER”, United States Coast Guard, <https://www.uscg.mil/hq/cg5/cg531/AMIO/AbM.asp>, (Accessed September 2, 2015).

⁶ “Alien Migrant Interdiction: Operation ABLE VIGIL”, United States Coast Guard, <https://www.uscg.mil/hq/cg5/cg531/AMIO/AbV.asp>, (Accessed September 2, 2015).

⁷ “Alien Migrant Interdiction: Mariel Boatlift”, United States Coast Guard, <https://www.uscg.mil/hq/cg5/cg531/AMIO/mariel.asp>, (Accessed September 2, 2015).

While each event possesses different characteristics related to length and number of migrants, it is possible to determine a rate of migration to help quantify the term “mass migration.” Figure 1 displays the monthly migration rate of these three Caribbean mass migration events which range from 1,000 to 21,000 migrants per month.

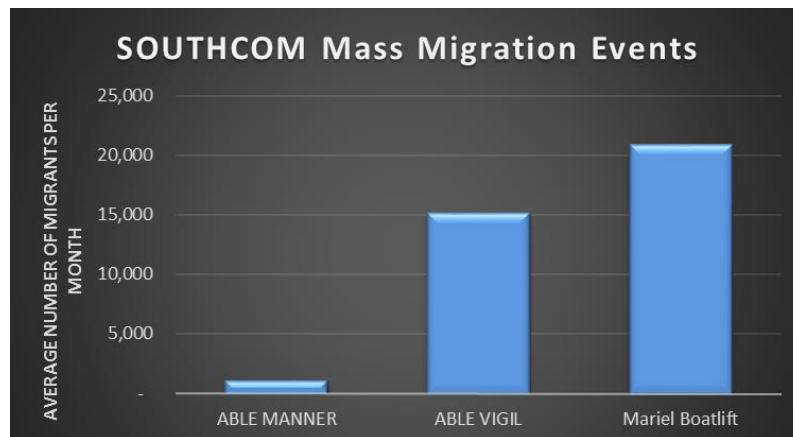


Figure 1: Migrants per Month for Caribbean Mass Migration Events

Breaking up the data in this manner provides three different thresholds to compare other migration events to vice imposing a potentially arbitrary number. This enables a more accurate comparison of current and historic mass migration events.

To summarize, mass migration has been an ongoing international concern dating back to the middle of the 20th century. Countries have been plagued by and have had to address mass migration and refugee issues on a regular basis. This includes the United States which has contended with mass migration events throughout its history. Countries have and will continue to have to respond to mass migrations as long as the motivations for mass migration continue to exist. The foundations for these motivations are discussed in the next chapter.

Chapter 3: Migrant Motivation

University of Georgia professor Everett S. Lee first presented a “push-pull” model for explaining migrant patterns in 1966.¹ This model hypothesizes that insight into migration can be gained by studying factors in the origin country that work to push migrants away and factors in the destination country that pull migrants towards it. Lee also presents the idea that intervening obstacles impact the decision to migrate in multiple ways by affecting ease of travel as perceived by the migrant. These obstacles can range from geographic distance to man-made barriers. Finally, there is a human element in the migrant’s decision that influences the cost to benefit analysis that each migrant considers.

This author proposes an alteration to Lee’s model by adding a “path” factor to the existing “push-pull” model. The path includes all factors related to Lee’s intervening obstacles. Additionally, it includes knowledge of those obstacles, the systems put into place to facilitate surmounting them such as smugglers, and characteristics of the path itself. For mass migration events, one of the most important path factors is capacity. Capacity is in turn related to the speed and size characteristics of the path. A path that is easy to enter, transit, and exit will have a high flow rate. However, even a path that is difficult to enter or exit may have a high flow rate if there are numerous points of entry or exit. An example of such a path may be difficult to enter, but this difficulty would be overcome by the availability of numerous entry points. Paths with either of these characteristics can result in a large number of migrants arriving at the host country in a short period of time. A path’s ability to support a high migrant flow rate is crucial to the creation and sustainment of a mass migration.

To summarize, a mass migration event requires the appropriate levels of “push” out of

¹ Everett S Lee, "A Theory of Migration." *Demography*, Vol. 3, No. 1, 1966: 47-57.

the origin country, “pull” from the destination country, and a “path” with the capacity to handle a mass migration event. The push, path, and pull factors create a chain that links the migrant and their decisions to the destination country.

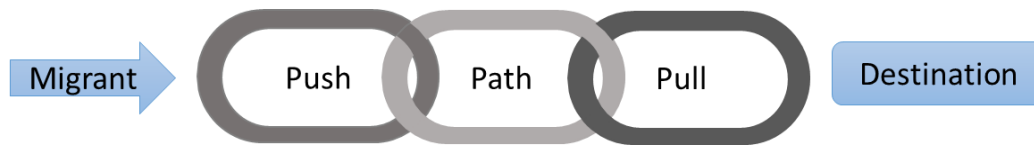


Figure 2: Characteristics of Push, Path, and Pull Factors Influencing Migration

From Migration to Mass Migration

The decision to leave one’s home cannot be explained by push, path, and pull factors alone. The conclusion to leave one’s home, livelihood, and possibly family for a destination that, while known about is not truly known, is an intensely personal one. Often the journey itself is dangerous and can be life threatening. For example, the three Caribbean mass migration events resulted in 36 known deaths.² Additionally, the International Organization for Migration reports that the current European mass migration event resulted in 2,373 deaths at sea in the first eight months of 2015.³ Knowledge of what would make such a large number of people endure the risks inherent in a mass migration could also provide indicators to help predict future migrations.

While much of Lee’s work is applicable to mass migration events, it is obvious that there are significant differences between the standard migrant he proposes, and those that take

² “Alien Migrant Interdiction: Mariel Boatlift”, United States Coast Guard, <https://www.uscg.mil/hq/cg5/cg531/AMIO/mariel.asp> (Accessed September 2, 2015). There were 27 known migrant deaths during the Mariel Boatlift. Operation ABLE MANNER suffered 9 casualties. These numbers obviously do not include any migrants that may have been lost at sea without the Coast Guard’s knowledge.

³ “IOM Continues to Monitor Mediterranean Migrant Arrivals and Deaths“, International Organization for Migration, <http://www.iom.int/news/iom-continues-monitor-mediterranean-migrant-arrivals-and-deaths>, (Accessed September 30, 2015).

part in a mass migration due to a perceived existential threat. This is seen in the emphasis that he attributes to positive and negative selection: “By positive selection is meant selection for migrants of high quality and by negative selection the reverse.”⁴ He goes on to state that “Migrants responding primarily to minus factors at origin tend to be negatively selected; or, where the minus factors are overwhelming to entire population groups, they may not be selected at all.”⁵ In this case, selection equates to the decision to migrate; high quality migrants leave because the destination is attractive while low quality migrants leave their origin because they feel they must. Also, factors that are widely spread amongst the population may not influence a migrant to leave. However, this hypothesis does not fully apply to mass migration events caused by threatening situations. For many potential refugees, remaining at their origin is often perceived as life threatening regardless of whether or not the migrant is considered to be “high quality.” These refugees leave their home primarily due to the inability to satisfy safety and physiological needs and not because they feel the destination is an attractive one. This represents a broad negative selection across the quality spectrum. The desire to distance oneself from a threat crosses educational, economic, and cultural boundaries and is applicable to all qualities of migrants. This type of threat avoidance can be seen as an attempt to satisfy physiological and safety needs as defined by Abraham Maslow.⁶ Maslow’s hierarchy of needs provides a model that aids in correlating migrant needs to Lee’s push and pull concept.

According to Maslow, humans have a basic need to survive, and to ensure access to the physiological resources necessary to do so.⁷ Some physiological resources are acquired

⁴ Lee, "A Theory of Migration", 56.

⁵ Ibid.

⁶ Abraham Maslow, "A Theory of Human Motivation", *Psychological Review*, 1943: 370-396.

⁷ Ibid.

subconsciously; however, one will consciously seek them out if they are denied. Other physiological resources must be sought and acquired consciously. Resources required in order to satisfy this level of need include the elements required to maintain survival, sustenance, health, and shelter. Once these physiological needs are satisfied, the requirement for safety must be satisfied. Safety needs can be satisfied once one feels they are free from harm. Conversely, safety needs are threatened when one perceives they are subject to harm. For example, being subject to involvement in conflict, or suffering persecution may negatively impact one's assessment of their own safety. The need for love and belonging is the next level of the hierarchy, and may explain the tendency of migrants to bring family members with them on their journey, or endeavor to have family members join them once the migrant reaches their destination. The ability to provide for oneself and one's family can impact esteem as well as safety and physiological factors. The final need, self-actualization, may cause a person to migrate, but the causes of self-actualization are likely to be too personal to the individual to cause a mass migration event. For example, a single migrant may be compelled to migrate because they feel they have a better chance to achieve personal goals at their chosen location. However, it is highly unlikely that the same source of achievement can be applied to the disparate individuals involved in a mass migration. The full hierarchy is displayed in Figure 3.



Figure 3: Maslow's Hierarchy of Needs⁸

Why Risk the Journey?

One component of the decision to migrate is based on comparing the risk inherent to both options; either to migrate or to remain in one's country of origin. Everybody accepts a level of inherent risk in their environment. The amount of risk present is based on many factors including individual wealth, acclimatization to needs deprivation, and stability and effectiveness of social and governmental structures.

Each person perceives a level of risk associated with moving between locations. For example, a person leaving their home risks losing all the comforts of their origination, contact with family and friends, danger in transit, and unknown situations at their destination.

Threats to a person's ability to satisfy their needs as presented by Maslow can raise environmental risk such that the risks inherent with staying in a given location surpass the risks of migrating. At that point, migrating to a new location may be in that person's best interest. The risk curve that the migrant's decisions are subject to is shown in Figure 4.

It is important to note several caveats:

- The potential migrant makes their decision based on perceived as opposed to actual risk. However, since the migrant does not have full situational awareness of all factors that influence their choice, perception is reality.
- The levels of risk due to staying or to migrating do not have to continue to rise, nor do they have to move in a uniform manner. The level of risk is subject to fluctuations based on multiple influences. For example, changes in immigration policy towards

⁸ Saul McLeod, "Maslow's Hierarchy of Needs", Simply Psychology, 2014, <http://www.simplypsychology.org/maslow.html>, (Accessed 27 January, 2016).

migrants may change the perceived risk of migrating. Also, changes to the situation pushing the migrant to leave may influence the perceived risk of remaining at the origin location.

- Inflection points exist on this curve at which the risk of staying can continue rising, or can drop. Unfortunately, for the migrant, they rarely have any influence on the inflection point. Lack of perceived influence may affect the speed at which the perceived risks of staying increase.

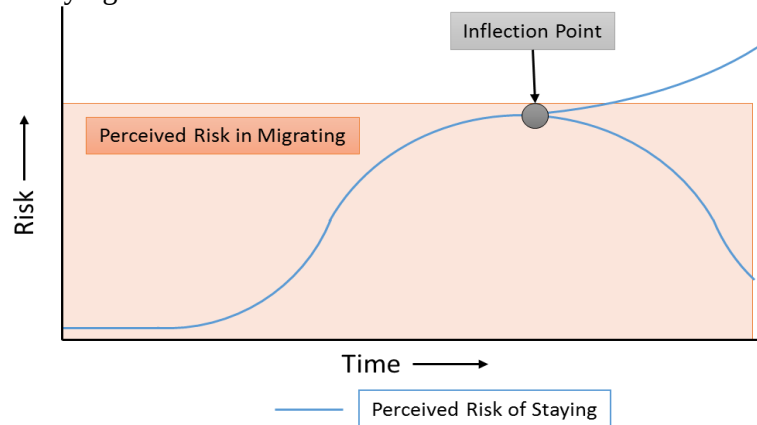


Figure 4: Migrant Risk Perception Curve

In summary, everybody lives with some level of risk in their life. However, that level of risk is usually not enough to make them leave their current location. Also, each person has their own level of tolerable risk and perception of that tolerance. The amount of risk a person regularly encounters, their perception of that risk, and their individual tolerance for risk is a personal characteristic that varies based on an incalculable number of factors. A potential migrant also perceives a level of risk in the migratory journey, and risks characteristic of the destination itself. In the end, the migrant performs a risk analysis that compares the level of risk associated with staying at the origin against the risks associated with the journey and destination. A migrant is more likely to migrate if the risks inherent with the former outweigh the risks attributed to the latter two. This risk analysis will be seen in the next chapter's investigation of the almost continuous mass migration events that have impacted the United States throughout its history.

Chapter 4: America's Never Ending Mass Migration "Crisis"

Analysis of historical mass migration events will demonstrate the applicability of the push-path-pull model to previous mass-migration events into the United States. By studying history, it is possible to determine if historical events fit the categories of motivation in accordance with the push-path-pull model and Maslow's Hierarchy.

Mass migration is not a recent phenomenon for the United States. Analysis of historical migration data shows that the US repeatedly experienced mass migration events with intensities similar to the previously mentioned Caribbean events. In fact, each decade since the 1850's experienced mass migration events with a greater monthly rate of migration than Operation ABLE MANNER. Additionally, there have been multiple events with average migration rates equal to or greater than the Mariel Boatlift. Figure 5 charts the average monthly migration for each decade since the 1850s of the predominant migrant group as identified by the US Department of Homeland Security. For example, 1,029,486 people migrated from Ireland in the 1850's resulting in an average of over 8,500 Irish arriving monthly over the 10-year period.¹ Using this dataset to identify historic mass migration events results has several advantages:

- Diversity in time
- Diversity in migrant origin including old and new world countries
- Diversity of cultures
- Diversity in modes of travel

¹ Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics* (Washington D.C.: U.S. Department of Homeland Security, 2010), 5-6.

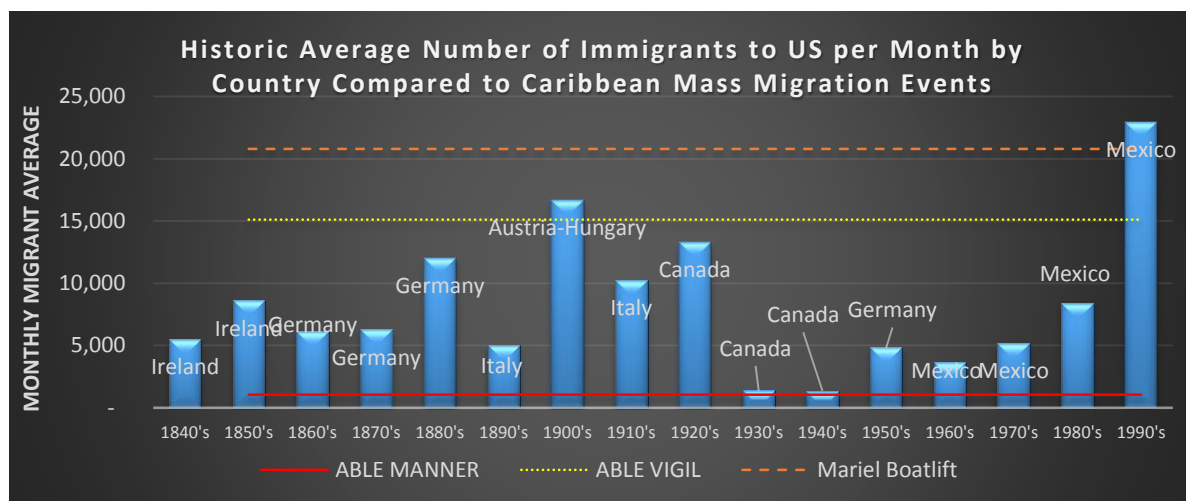


Figure 5: US Migration Trends Compared to Caribbean Mass Migration Events

Next, it is important to understand the situation in the origin country at the time of these historic mass migrations. The following section describes the instigation for migration events in each decade since 1850.

The 1850s

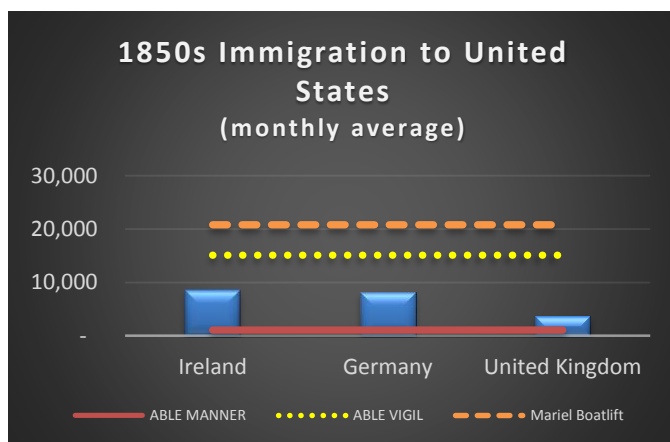


Figure 6: Top 3 Average Monthly Immigration to the United States During the 1850s

Figure 6 shows the migration effects of the famine Ireland suffered in the 1840s that resulted in between 500,000 and 1,500,000 deaths out of a population of 8.5 million.² Cholera

² Phelim P. Boyle, Cormac O Grado. "Fertility trends, excess mortality, and the Great Irish Famine." *Demography*, November, 1986, 543.

was a major killer as well for many of those weakened by starvation.³ Over 650,000 migrants entered the United States during that decade in order to escape the famine's effects. These migrants often worked in the US with the goal of paying for the passage of relatives still in Ireland. Even though the blight that caused the famine had receded by the early 1850s, Irish continued to migrate to America to join those who left during the famine.⁴

Additionally, Germany experienced the last and greatest middle-class European revolutions in 1848 through 1849.⁵ These conflicts ended with the defeat of liberalism in the newly unified Germany. The resultant suppression by conservative militaristic forces resulted in a rate of migration to the US during the 1850s that was second only to Ireland.⁶

The United Kingdom began experiencing a population boom coinciding with the slowing growth of their industrial revolution. Deteriorating urban conditions coupled with an America that offered open immigration, familiar culture and language, and abundant inexpensive land proved to be an attractive lure for those who sought a better life.⁷

1860s Through the 1880s

The 1860s through the 1880s continued the trend of migration events that were larger than Operation ABLE MANNER, though only one approached the levels of Operation ABLE VIGIL.

³ Illustrated London News, "The Tide of Emigration to the United States and to the British Colonies", Views of the Famine, last modified July 6, 1850, <https://viewsofthefamine.wordpress.com/illustrated-london-news/the-tide-of-emigration-to-the-united-states-and-to-the-british-colonies/>, (Accessed September 3, 2015).

⁴ Public Broadcasting System, "Destination America", http://www.pbs.org/destinationamerica/usim_wn_flash.html, (Accessed October 2, 2015).

⁵ Theodore S. Hamerow, "History and the German Revolution of 1848", *The American Historical Review*, vol. 60, No. 1, (October 1954): 27.

⁶ Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics*, 5-6.

⁷ Voice of America, "Immigrants: America's Industrial Growth Depended on Them", last modified October 19, 2015, <http://www.manythings.org/voa/history/135.html>, (Accessed March 12, 2016).

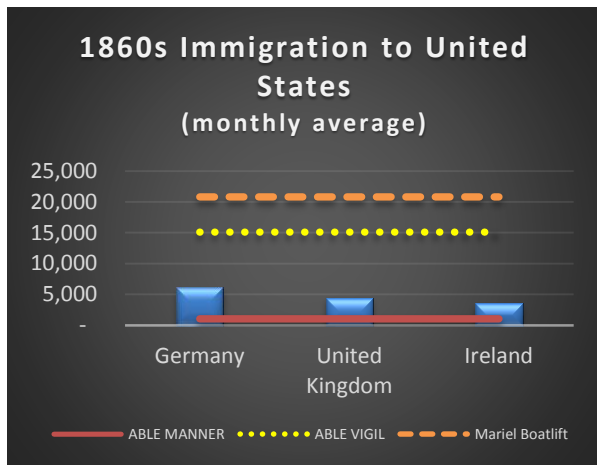


Figure 7: Top 3 Average Monthly Immigration to the United States During the 1860s

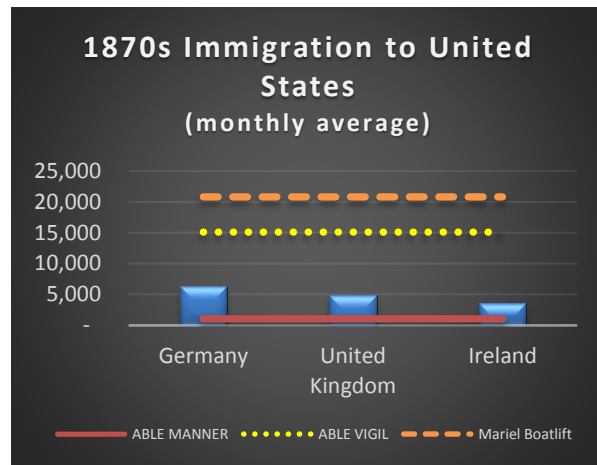


Figure 8: Top 3 Average Monthly Immigration to the United States During the 1870s

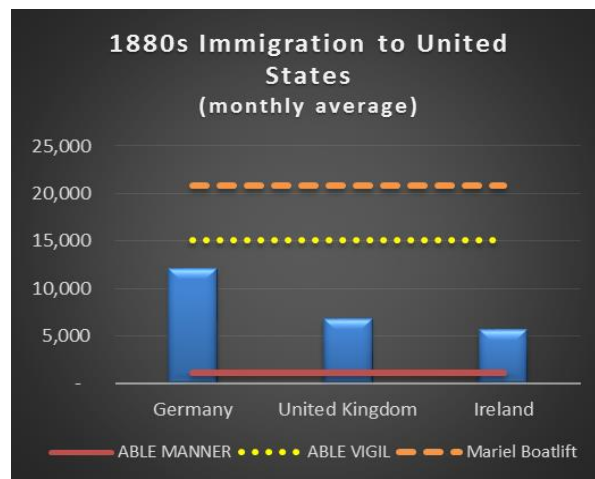


Figure 9: Top 3 Average Monthly Immigration to the United States During the 1880s

First, Germany continued to feel the effects of the revolution of the late 1840s as well as involvement in two wars during this period.⁸ Additionally, chronic low wages, and the unsettling effects of the wars of German Unification exacerbated push factors.⁹ Conflict avoidance and economic opportunity combined with the draw of previous migrants resulted in Germans leading US immigration for three decades.

⁸ Various German states participated in the Austro-Prussian War in 1866 and the Franco-Prussian War in 1870.

⁹ Stuart Anderson, *Immigration*, (Santa Barbara, CA: Greenwood, 2010), 27.

The United Kingdom continued as the second largest source of immigrants during this period. A large portion of these immigrants were skilled workers, machinists, and miners who helped to drive America's industrial revolution in pursuit of a better life.¹⁰ Also, once again, crop failure contributed to a surge in Irish immigrants in the 1880s. This new famine contributed to a 60% increase in Irish obtaining permanent resident status between the 1870s and 1880s.¹¹

1890s Through the 1910s

The 1890s through the 1910s saw a rapid rise in migration numbers with mass migration rates from two countries exceeding even those seen in Operation ABLE VIGIL.

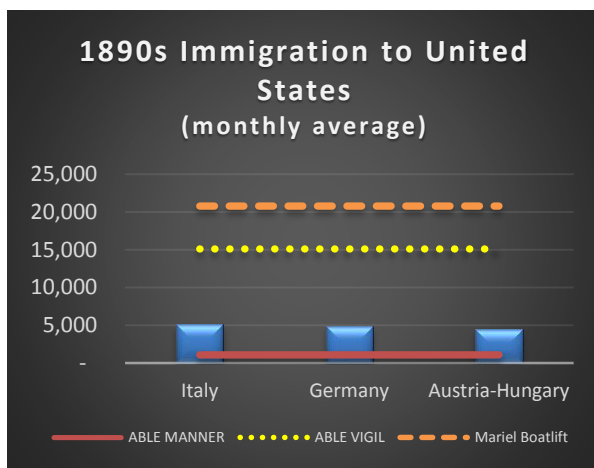


Figure 10: Top 3 Average Monthly Immigration to the United States During the 1890s

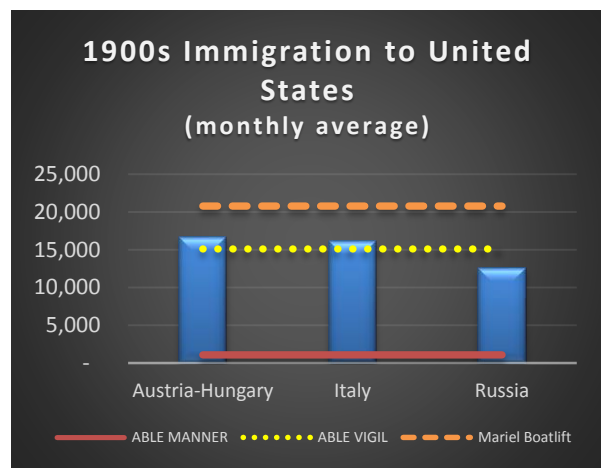


Figure 11: Top 3 Average Monthly Immigration to the United States During the 1900s

¹⁰ Ibid., 21.

¹¹ Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics*, 5-6. There were 674,061 Irish immigrants in the 1880s, and 422,264 in the 1870s.

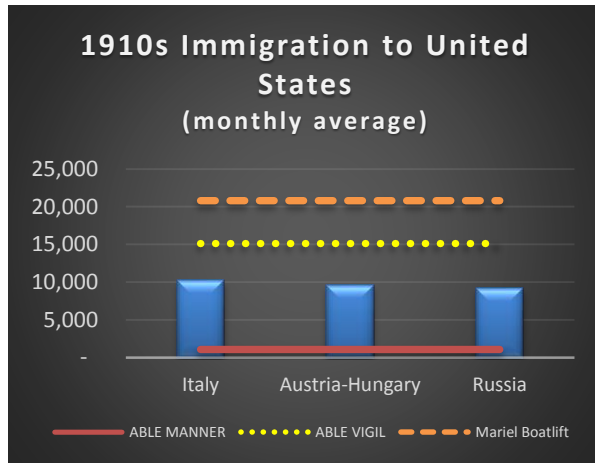


Figure 12: Top 3 Average Monthly Immigration to the United States During the 1910s

Italian migration during the 1890s was low compared to the previous two examples, but still maintained a rate greater than Operation ABLE MANNER over a decade. However, the 1890s was just the tip of the iceberg in the wave of Italian migration. Over the next four decades over 4 million Italians immigrated to the US.¹² This wave of migration can be attributed to the after-effects of the wars of Italian unification which helped to provide the initial impetus for Italian migration. Poverty in rural areas of Italy and Sicily also contributed to the migration.¹³

The Austria-Hungary immigration wave of the 1900s was the largest number of migrants by decade until the 1990s. It also was the first mass migration event to have a rate greater than Operation ABLE VIGIL. The second to surpass this threshold was the Italian migration in the same decade.

Additionally, Russia saw a threefold increase in the number of migrants from the previous decade at over one and a half million migrants.¹⁴ Russia endured a famine from 1891 to 1892 resulting in half a million deaths. The early 1900s were a tumultuous time for

¹² Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics*, 6.

¹³ Public Broadcasting System, "Destination America."

¹⁴ Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics*, 6.

Russia. Their defeat in the 1905 Russo-Japanese War resulted in a loss of national prestige and additional public discontent that fueled mass demonstrations, strikes, a violent campaign against the ruling regime, and unrest in the military.¹⁵ The initial wave of migrants in the 1890s paved the way for the migrants of the next decade as they escaped famine and unrest respectively.

1920s Through the 1940s

The 1920s was the first decade to see mass migration from other North American countries.

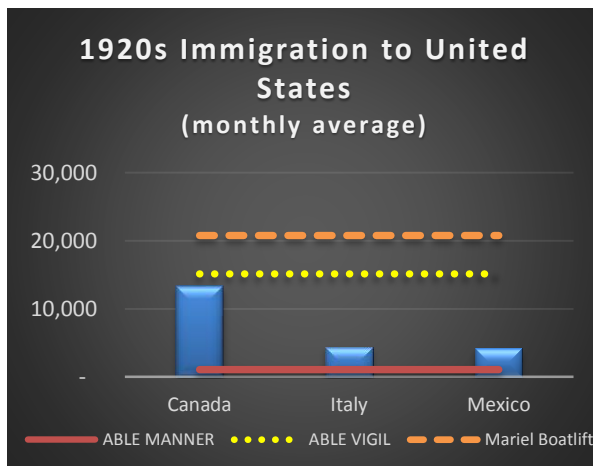


Figure 13: Top 3 Average Monthly Immigration to the United States During the 1920s

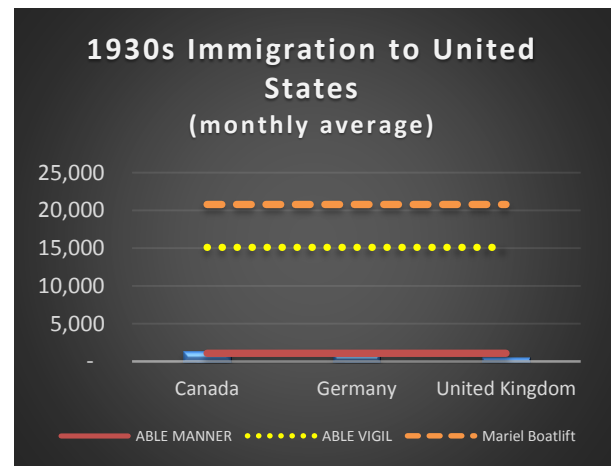


Figure 14: Top 3 Average Monthly Immigration to the United States During the 1930s

¹⁵ Voline, "The Unknown Revolution, 1917-1921", <http://www.ditext.com/voline/unknown.html>, (Accessed October 2, 2015).

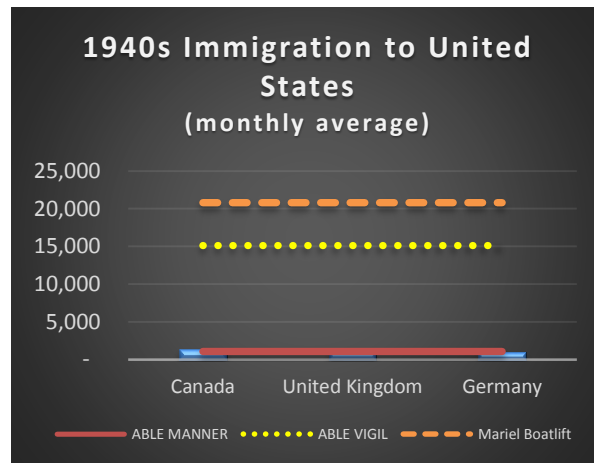


Figure 15: Top 3 Average Monthly Immigration to the United States During the 1940s

Canadian migration in the 1920s represented one of the first mass migrations that was not instigated by violence or famine. Canadians benefited both from American labor demand and increased restrictions on European migration. The Emergency Quota Act of 1921 limited immigration from countries outside the western hemisphere just 3% "... of the number of foreign-born persons of such nationality resident in the United States."¹⁶ The United States closed its borders to those outside the west, but still possessed most of the qualities that attracted previous migrants. The Emergency Quota Act enabled many Canadians to, almost exclusively, take advantage of the US need for labor, and they were able to improve their financial standing because of it.

A combination of migration reforms, the Great Depression, and the march towards World War II resulted in a massive decrease in immigration during the 1930s. The war and subsequent US occupation of Europe and Japan then continued to suppress migration through the first half of the 1940s.

¹⁶ Sixty-Seventh Congress, "An Act to Limit the Immigration of Aliens into the United States", *University of Washington Bothel*, 1921, <http://library.uwb.edu/guides/USimmigration/42%20stat%205.pdf>, (Accessed October 2, 2015), 5.

1950s

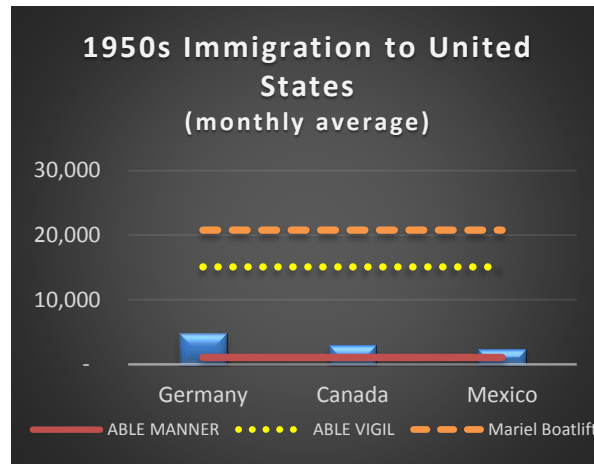


Figure 16: Top 3 Average Monthly Immigration to the United States During the 1950s

The 1950s saw an increase in migrants from multiple European nations, foremost of which was Germany with almost 600,000 migrants. However, multiple nations at least doubled their number of immigrants to the US over the previous decade. This included all the former Axis powers of World War II. The greatest increase was by Japan which saw the number of applicants seeking US residence increase from 1,557 to 40,651. These waves of migration can be attributed to the Displaced Persons Act of 1948 and the Refugee Relief Act of 1953 as migrants sought to escape countries and economies ravaged by the effects of World War II. This was another example of policy affecting migrant decisions.

1960s Through the 1990s

These four decades saw the rise of North America countries as the primary source of migrants to the US.

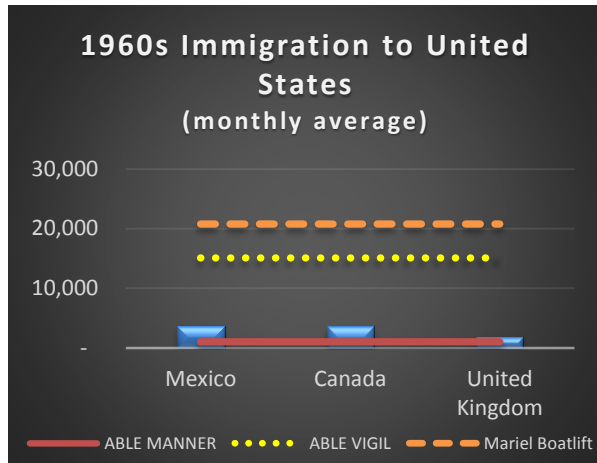


Figure 17: Top 3 Average Monthly Immigration to the United States
During the 1960s

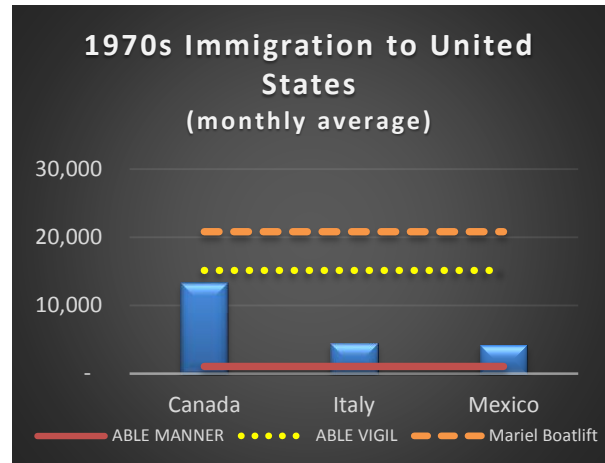


Figure 18: Top 3 Average Monthly Immigration to the United States
During the 1970s

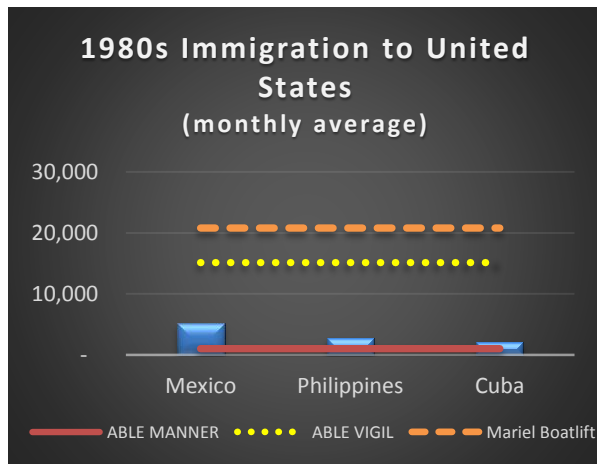


Figure 19: Top 3 Average Monthly Immigration to the United States During the 1980s

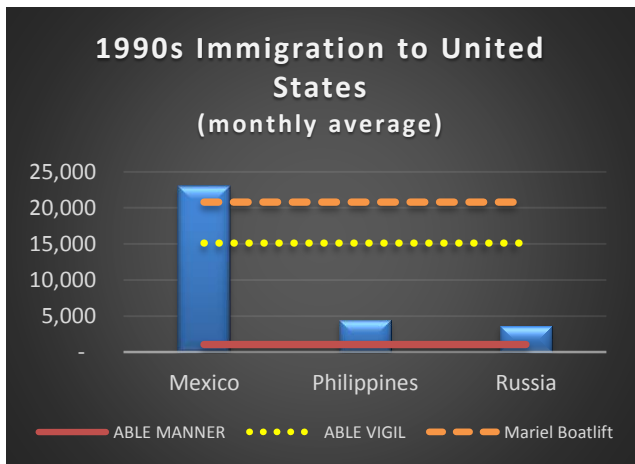


Figure 20: Top 3 Average Monthly Immigration to the United States During the 1990s

Both Mexico and Canada continued to take advantage of proximity and ease of access as they led immigration into the US. Immigrants from both countries saw an economic advantage to migrating to the United States. Perceived economic incentives also enticed migrants from the United Kingdom, Italy, Russia, and the Philippines.

Cuban migration shows the effects of the Mariel Boatlift as well as the United States' lenient immigration policy towards Cuban refugees.

The Mariel Boatlift

The Mariel Boatlift represents unique push, path, and pull factors for immigration. In the origin country, the leadership announced that anyone who wanted to leave Cuba was free to do so. Cuban leader Fidel Castro saw emigration as a way to remove undesirable elements.¹⁷ His actions dissolved emigration barriers for those who wished to leave.

Path factors that were favorable to migration also existed. Cubans in the United States chartered boats to go to Cuba and retrieve friends and relatives. The large charter fleet provided the volume to move more than 100,000 people. Mariel provided an adequate port in Cuba that enabled the charters to embark large numbers of people quickly. Also, Mariel is only 125 miles from Key West Florida, resulting in a relatively short trip. In addition, US Coast Guard and military assets were on hand to monitor the transports and help those in distress. Finally, the US set up a receiving system capable of processing and integrating arrivals. The US and Cuba were both very effective path enablers.

In addition, the United States' policy presented many pull factors that enticed migrants. The US immigration policy was very friendly towards any Cuban that made it to the US; the 1966 Cuban Adjustment Act provided permanent residence for Cubans who had "...been physically present in the United States for at least two years"¹⁸ This waiting period was reduced to only one year by amendments to the Immigration and Nationality Act.¹⁹ Also, the US had had a history of accepting Cuban migrants through special humanitarian provision

¹⁷ Alex Larzellere, *The 1980 Cuban Boatlift*, (Washington D.C.: National Defense University Press, 1988), 215.

¹⁸ United States House of Representatives, "Public Law 89-732", Government Publishing Office, November 2, 1966, <http://www.gpo.gov/fdsys/pkg/STATUTE-80/pdf/STATUTE-80-Pg1161.pdf>, (Accessed October 3, 2015).

¹⁹ United States House of Representatives, "Public Law 94-571", *Government Publishing Office*, October 20, 1976, <http://www.gpo.gov/fdsys/pkg/STATUTE-90/pdf/STATUTE-90-Pg2703.pdf>, (Accessed October 3, 2015).

vice making them use the same procedures as other immigrants.²⁰ Additionally, a large community of Cubans existed in Miami, and many migrants had relatives there. According to Eugene Eidenburg, White House liaison to the Cuban-American community at the time of the boatlift there was a “...sincere interest in facilitating family reunions”²¹ on the part of the Carter administration. The Mariel Boatlift provides an excellent example of the convergence of favorable push, path, and pull factors in the creation of a mass migration.

2000s

The new millennium saw Mexico continue as the leading source of new immigrants. Additionally, the 2000’s saw significant increases in the numbers of migrants from China, and India due to economic opportunities in the US.

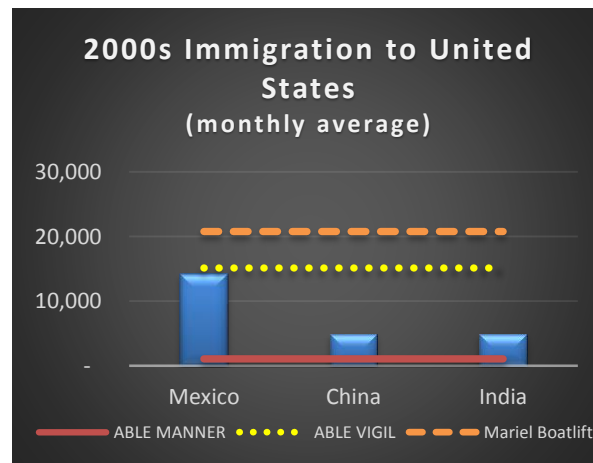


Figure 21: Top 3 Average Monthly Immigration to the United States During the 2000s

Summary of Historical Push, Path, and Pull Factors

The above study of mass migration events in the United States indicates several commonalities in push, path, and pull factors, and highlight multiple points.

²⁰ Sylvia Rusin, Jie Zong, and Jeanne Batalova, *Migration Policy Institute*, <http://www.migrationpolicy.org/article/cuban-immigrants-united-states>, (last modified April 7, 2015, Accessed October 3, 2015).

²¹ Alex Larzellere, *The 1980 Cuban Boatlift*, 241.

Push Factors

- Negative impacts to the physiological and safety levels of Maslow's hierarchy proved effective push factors in multiple instances. For example, the Irish famines, and multiple wars resulted in several mass migration events.
- Emigration policies of origin countries can also provide a persuasive push factor. Castro's willingness for Cubans to leave at the beginning of the Mariel Boatlift provided a powerful push for Cubans who may have been on the fence about leaving the island.

Path Factors

- The US immigration processing infrastructure was crucial to creating a path with the capacity to handle large migrant influxes over long periods of time.
- The shipping industry was capable of creating a high capacity migration path capable of crossing a large barrier (the Atlantic Ocean) prior to the invention of aircraft.

Pull Factors

- Favorable US policy towards migrants from North and South America provided a strong pull factor and resulted in large numbers of migrants from Mexico, Canada, and Cuba.
- Increased economic opportunity proved to be an effective pull factor capable of drawing migrants from countries in which safety and physiological factors were satisfied. Economic opportunity in the US was able to draw large numbers of migrants from developed countries in the 1960s and 1970s.

- Ireland, Germany, Italy, Mexico, and others have been the source of several multi-decade mass migration events that were facilitated by social, familial, and cultural connections in the US.
- The presence of conflict in the US affected the number of migrants trying to enter the country. For example, the United States experienced significant drops in the number of applicants for legal residence status during the Civil War. The 1850s saw over 350,000 requests for legal residence status in the United States, while there were just over 150,000 in the 1860s.²² This conflict weakened positive push factors present in the US at the time.
- Economic opportunity has surpassed physiological and safety needs as the primary pull factor for more recent mass migrations.
- Geographic proximity also affected mass migrations into the US. The United States shares borders with Canada and Mexico. These two nations have been leading sources of immigrants since the 1920s. The one exception was the 1950s in which Germany provided the most immigrants. Even then, Canada and Mexico were ranked second and third. As stated before, this immigration dominance is also attributable to the US policy that began with the Emergency Quota Act of 1921 of not enforcing quotas on western hemisphere nations. Figure 22 shows the number of migrants per decade from Mexico, the Caribbean, and Central and South America. It can be seen that there is a correlation between distance from the US and immigration numbers. Mexico, which shares a border with the US, provides the largest number of immigrants. The low population Caribbean is next, partially due to its close proximity and easy

²² Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics*, 6.

seaborne access to the United States. Central America has kept pace with South America even though it has less than one-fifth the population of the more distant southern continent.²³

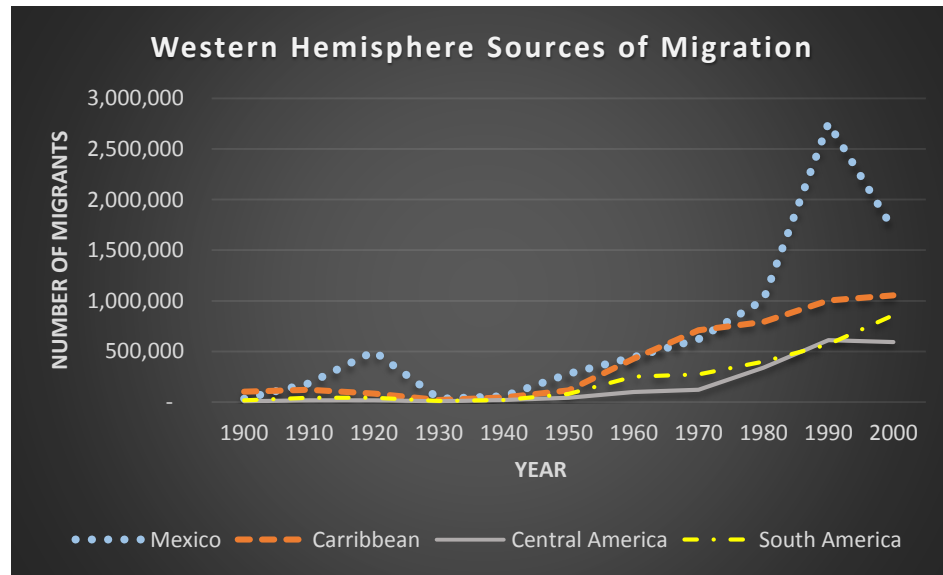


Figure 22: Western Hemisphere Sources of US Immigration²⁴

In summary, the historical analysis of mass migration events into the United States confirms the previously postulated theory that migrants move in order to increase their chance of satisfying one or more aspects of Maslow's hierarchy. The study of indicators in the next chapter will apply the motivational framework, and historical proof to the current environment.

²³ Index Mundi, "Population – Central America & the Caribbean", <http://www.indexmundi.com/map/?r=ca>, and Statistics Times, (Accessed 27 November, 2015) and "List of South American Countries by Population 2015", <http://statisticstimes.com/population/south-american-countries-by-population.php>, (Accessed 27 November, 2015). Index Mundi states that the population of Central America as approximately 84,000,000 persons while Statistics Times states that South America possesses over 415,000,000.

²⁴ Office of Immigration Statistics, *2010 Yearbook of Immigration Statistics*.

Chapter 5: Looking Forward - Finding Leading Mass Migration

Indicators

So far, this paper has connected Maslow's hierarchy of needs to migrant motivation. Additionally, the push-path-pull framework has been presented to describe the factors that influence the decision to migrate. Historical analysis of mass migration events shows that an inability to satisfy basic needs coupled with the presence of strong push, path, and pull factors result in an environment that is conducive to a mass migration event.

However, leading indicators must be found in order to look forward, and predict characteristics of future mass migration events. A leading indicator is an accessible piece of information that shows the existence of push, path, and pull factors along with the presence threats to the satisfaction of various levels of Maslow's hierarchy. Observation and integration of these indicators can provide forewarning of a mass migration.

Indicators can be divided into two categories; interpretation of qualitative data such as news reports and social media, and quantitative statistical data. Both types of data have advantages and disadvantages.

	Advantages	Disadvantages
Qualitative Sources	Real-time Social media is open source and available	Narrow focus Anecdotal
Quantitative Sources	Comprehensive Statistically rigorous	Delayed Sometimes closed source

This paper focuses on statistical analysis of quantitative sources such as economic, corruption, and other information compiled by various organizations. However, this author believes that an analysis of qualitative sources would be a subject well worthy of further analysis.

Analysis of Potential Indicators

There are numerous statistical indications of a country's health. Economic, corruption, and conflict data are just a few of the statistical measurements published on a regular basis. Before performing a more in depth analysis of correlating factors, one must determine which of the available datasets show a correlation and the strength of that correlation to statistics on the number of refugees leaving a country.

The following lists enumerates the datasets that were initially studied for strength of correlation to yearly refugee out and inflow numbers¹:

- Population of the origin country
- Country Gross Domestic Product (GDP) and Per Capita GDP from the World Bank
- Corruption Perception Index - Transparency International
- Refugee In and Outflow - United Nations High Commission for Refugees
- Total number of Homicides and Homicides per 100,000 people - United Nations
- Cash Surplus - United Nations
- Percent of Population with Internet - United Nations
- Conflict Presence - Uppsala Conflict Data Program and Peace Research Institute
- Amount of population affected by disasters - EM-DAT International Disaster Database
- Human Development Index (HDI) - United Nations
- Distance between national capitals - Kristian S. Gleditsch. The unique one country to many destinations structure of this data precludes it from being included in the preliminary correlation analysis.

Unfortunately, not all data points are available for all years across all countries. For example, while UN refugee numbers are available starting from 1975, Corruption Perception Index data was first published in 1995.² This problem makes it impossible to obtain comprehensive correlation data for all data sets across all years for all countries. However, the information that is available does provide insight into which indicators could prove useful

¹ Each of the datasets was drawn from the source identified with it.

² Transparency International, "Overview", <http://www.transparency.org/research/cpi/overview>, (Accessed 27 November, 2015).

after further analysis. The following sections detail the three techniques used to search for correlation between the indicators and refugee flow.

Correlation Statistics

Tables 1 and 2 show the Pearson's R correlation statistic of each of the aforementioned data sets (except travel distance) with refugee outflow and refugee inflow numbers respectively.³ The sign of the correlation statistic indicates whether the correlation is positive or negative, and the absolute value is used to rank correlation strength. The correlations include more than 6,000 data points; however, as stated previously several of the data sets provide considerably fewer points for comparison. For example, per capita GDP data is available for about 5,000 points, and HDI data is available for approximately 1,400 points. The deficiency of data prevents comprehensive correlation, but it does point out several relevant observations.

Table 1: Refugee Outflow Correlation Data Using Pearson's R Statistic

Refugee Outflow Correlation Data		
Data	Correlation Statistic	Absolute Value
Conflict	0.295	0.295
HDI	-0.192	0.192
Corruption Perception Index	-0.119	0.119
Percent Internet	-0.112	0.112
GDP Per Capita	-0.106	0.106
Total Homicides	0.048	0.048
GDP Country	-0.030	0.030
Homocides per 100k	-0.020	0.020
Refugees In	0.010	0.010
Cash Surplus	-0.004	0.004
Disaster (total Affected)	0.002	0.002
Population	0.000	0.000

³ Pearson's R statistic is a calculation of linear correlation between the values of two variables. It outputs a value from -1 to 1 as a measurement of correlation. If both values rise consistently then the statistic is closer to 1; however, if one value rises while the other value falls then the statistic will be closer to -1. Two completely unrelated variables will have no correlation, and yield a value of 0. Laerd Statistics provides a more thorough explanation on their website: <https://statistics.laerd.com/statistical-guides/pearson-correlation-coefficient-statistical-guide.php>.

First, the correlation between refugee outflow and conflict is one-third stronger than any other combination. Additionally, common sense correlations such as low GDP and refugee outflow are not reflected in the correlation statistic. This is a result of the one-way nature of all of the correlations which can be summarized as all mass migrations originate from poorly performing countries, but not all poorly performing countries experience mass migrations.

Table 2: Refugee Inflow Correlation Data Using Pearson's R Statistic

Refugee Inflow Correlation Data		
Data	Correlation Statistic	Absolute Value
Total Homicides	0.174	0.174
Population	0.148	0.148
GDP Country	0.144	0.144
Conflict	0.136	0.136
Homocides per 100k	-0.097	0.097
HDI	-0.090	0.090
Cash Surplus	-0.059	0.059
Disaster (total Affected)	0.047	0.047
Percent Internet	-0.036	0.036
GDP Per Capita	-0.031	0.031
Refugees Out	0.010	0.010
Corruption Perception Index	-0.002	0.002

The correlation statistic indicates that there is no good indicator of refugee inflow. The strongest correlation is to total number of homicides; however, the correlation is counterintuitive and weak. The positive value of the statistic implies that as the number of homicides in a country increases, so does the number of refugees it receives. Also, while the value is relatively high, analysis in the next section of this paper will show that it is statistically insignificant.

In conclusion, relying on Pearson's R is not a viable way to find strong correlations between indicators and migration numbers given the small sample size and the one way nature of the correlation.

Analysis of Variance (ANOVA)

The statistical data was also studied using analysis of variance (ANOVA); a technique that is able to simultaneously analyze the importance of multiple factors. ANOVA indicates the importance of each variable to an overall equation describing mass migrations, and the equation's relevance. Unfortunately, an ANOVA requires that all statistics be available for each data point. Only 190 migration events met the requirement of possessing all 12 of the previously used variables.

Table 3 shows regression analysis and the ANOVA describing the relationship between the indicator variables and the number of refugees exiting a country. The ANOVA table allows the user to create an equation that calculates the size of the refugee exodus based on indicator values. However, further study shows that this equation is highly flawed for the following reasons:

1. The low Adjusted R Square value of 0.04 indicates that this combination of variables correlates poorly to the number of refugees leaving a country.
2. The P-value column provides the best indication of the importance of each indicator. The P-value ranges from 1.00 to 0.00 and gives the probability of obtaining the same result if the indicator was not important. P-values close to zero imply that the indicator is relatively more important to an equation describing the number of refugees leaving. Unfortunately, conflict and HDI are the only indicators that show high values of statistical significance.
3. Finally, the large Standard Error provides insight into the applicability of the equation. One can expect a large amount of error in any attempt to calculate the number of refugees using this equation.

In summary, the most important variables have P-values close to zero and any interpretation of equation results must acknowledge a high margin of error. It is also extremely important to understand that the equation created only describes this particular set of data. It is capable of forecasting future events if given the appropriate inputs, but an ANOVA that includes that future event will be different from the one presented. For

completeness, the equation (with the most insignificant indicators removed) describing the size of the migrant exodus is presented below.

$$\begin{aligned} \text{Refugees Out} = & 1.82 \times \text{GDP Per Capita} - 7,632 \times \text{Corruption Perception Index} - 1479 \\ & \times \text{Homicides per 100k} - 2,876 \times \text{Cash Surplus} + 512 \times \text{Percent Internet} \\ & + 138,444 \times \text{Conflict} - 427,740 \times \text{HDI} + 343,681 \pm 207,305 \end{aligned}$$

Equation 1: Equation for Calculating Refugee Outflows

Table 3: Regression Statistics and ANOVA for Number of Refugees Leaving a Country
SUMMARY OUTPUT

Regression Statistics						
Multiple R	0.328417236					
R Square	0.107857881					
Adjusted R Square	0.047030009					
Standard Error	207305.1734					
Observations	189					

ANOVA						
	df	SS	MS	F	Significance F	
Regression	12	9.14431E+11	76202556750	1.773165458	0.055772383	
Residual	176	7.56368E+12	42975434926			
Total	188	8.47811E+12				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	343681.7806	125583.8424	2.7367	0.0068	95837.7491	591525.8121
Population	-0.0001	0.0002	-0.7238	0.4702	-0.0006	0.0003
GDP Country	0.0000	0.0000	-0.4565	0.6486	0.0000	0.0000
GDP Per Capita	1.8263	2.2019	0.8294	0.4080	-2.5192	6.1718
Corruption Perception Index	-7632.1846	13199.6576	-0.5782	0.5639	-33682.1628	18417.7937
Refugees In	-0.0823	0.0631	-1.3046	0.1937	-0.2067	0.0422
Total Homicides	0.0986	2.9942	0.0329	0.9738	-5.8106	6.0078
Homicides per 100k	-1479.8205	1176.6524	-1.2577	0.2102	-3801.9846	842.3435
Cash Surplus	-2876.7325	4154.1394	-0.6925	0.4895	-11075.0695	5321.6045
Percent Internet	512.2892	1294.5396	0.3957	0.6928	-2042.5293	3067.1077
Conflict	138444.3012	45003.9341	3.0763	0.0024	49627.4897	227261.1127
Disaster (total Affected)	-0.0015	0.0027	-0.5478	0.5845	-0.0069	0.0039
HDI	-427740.1505	205402.1408	-2.0825	0.0387	-833108.3387	-22371.9622

Table 4 shares many of the same problems related to predicting the number of refugees entering a country. All indicators show low statistical significance, and the Standard Error is large. It results in the following equation with an expected error value of just under a quarter-million refugees:

$$\begin{aligned} \text{Refugees In} = & -0.12 \times \text{Refugees Out} + 2.82 \times \text{GDP Per Capita} + 15,281 \\ & \times \text{Corruption Perception Index} + 2.72 \times \text{Total Homicides} - 2,344 \\ & \times \text{Homicides per 100k} - 9,072 \times \text{Cash Surplus} + 43.3 \times \text{Percent Internet} \\ & + 125,699 \times \text{Conflict} - 662,264 \times \text{HDI} + 423,728 \pm 246,606 \end{aligned}$$

Equation 2: Equation for Calculating Refugee Influxes

Table 4: Regression Statistics and ANOVA for Number of Refugees Entering a Country

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.390877705
R Square	0.15278538
Adjusted R Square	0.095020747
Standard Error	246606.6874
Observations	189

ANOVA					
	df	SS	MS	F	Significance F
Regression	12	1.93024E+12	1.60853E+11	2.64496408	0.002798992
Residual	176	1.07034E+13	60814858249		
Total	188	1.26337E+13			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	423728.3296	149156.4532	2.840831359	0.005030444	129362.9401	718093.7191
Refugees Out	-0.116415325	0.089237774	-1.304552101	0.193748702	-0.29252914	0.05969849
Population	-0.00011783	0.000244519	-0.4818862	0.630485472	-0.000600398	0.000364737
GDP Country	1.15343E-08	1.21947E-08	0.945846391	0.345523677	-1.25323E-08	3.56009E-08
GDP Per Capita	2.828410554	2.615773432	1.081290344	0.281047343	2.333908263	7.990729372
Corruption Perception Index	15281.54223	15674.72605	0.974916064	0.330939954	15653.06866	46216.15311
Total Homicides	2.726333068	3.555951668	0.76669576	0.444289602	4.291459829	9.744125966
Homicides per 100k	-2344.986012	1394.845884	-1.681179289	0.094501798	-5097.762331	407.7903062
Cash Surplus	-9072.985173	4900.933444	-1.851276961	0.065805321	-18745.14586	599.1755103
Percent Internet	43.30361781	1540.643717	0.028107483	0.977608271	2997.209737	3083.816973
Conflict	125699.1848	54133.42707	2.322025256	0.021376512	18865.00498	232533.3647
Disaster (total Affected)	0.002159181	0.003235941	0.667249777	0.505486494	-0.00422706	0.008545423
HDI	-662264.4501	242244.7284	-2.733865271	0.006899358	-1140342.752	-184186.1484

ANOVA condenses the data into deterministic equations that output easily understood results. However, one must be wary in their use. While it is desirable to have equations capable of calculating refugee inflow and outflow numbers, the ANOVA reveals several deficiencies that challenges their broad relevancy. First, the small sample size brings into question the applicability of the equations to the larger body of migrant events. Removing indicators from the examination is one way to increase the number of samples available. However, this action has limited use. For example, using all data points that possess only the indicators used in the refugee outflow equation still results in a paltry 260 samples. Additionally, the ANOVA table is not able to show the one-way relationship of some of the indicators; a problem shared with the correlation statistic. A final statistical analysis was done using scatterplots in order to overcome this deficiency.

Visual Analysis Using Scatter Plots

Regression analysis using scatterplots is less deterministic than the correlation statistic and ANOVA techniques used previously. However, it allows the user to perform a holistic examination of correlations by applying a spatial dimension to data. Plotting each data point according to its indicator values can display groupings and patterns indicating relationships. Conversely it can display randomness of data, indicating an absence of correlation. Additionally, unlike the previous techniques, it also makes one-way correlations apparent and useful. This technique provides the most useful method of determining correlations between migrant flows and indicators. These indicators can be categorized based on their correlation to and effect on the push, path, and pull factors detailed previously. The following sections present and discuss those visualizations using the most promising indicators.⁴

Push Factors

An environment that is perceived to endanger one's ability to satisfy their basic needs has historically been the cause of mass migration events. Based on this, it is reasonable to conclude that an environment detrimental to the ability to satisfy Maslow's hierarchy makes a country subject to experiencing a migration exodus. The presence of famine, conflict, and economic turmoil negatively impact physiological, safety, and esteem needs. Open source reporting is one resource for detecting the presence of these conditions. Additionally, social media may also be used to provide real time information directly from those affected. Both of these techniques are more up to date than statistical data which requires time for research and acquisition. However, statistical data is still useful since it is often more comprehensive than news and social reports, broader in scope, and less prone to bias. Examining statistical data

⁴ The scatterplots for the most promising indicators are presented in the paper. User selectable scatterplots of all indicators analyzed (including those with low correlation coefficients) are available at <http://www.reggie3.com/global-visualization/scatterplots.html>.

quantifying economic distress, conflict, and lawlessness shows that those factors remain the foundation of mass migration.

Economic Push Factors

Economic distress can negatively impact the ability to achieve satisfaction of all levels of Maslow's hierarchy. The effects of economic stress as a push factor can be seen by comparing refugee numbers and national per capita gross domestic product (GDP). Per capita GDP is a measure of a nation's financial strength relative to its population, and is determined by dividing a nation's GDP by its population. The World Bank publishes authoritative GDP data for the past several decades.⁵ Each point in Figure 23 represents one country for one year. It plots the number of refugees against the per capita GDPs of their countries of origin, and shows that mass migration events only originate from countries with low per capita GDPs. However, this correlation does not work in the other direction; not all low per capita GDP countries experience mass migration events. Put simply, all countries experiencing a mass migration event were in distress; however, not all distressed countries experienced a mass migration event. This is an example of the one-way correlation noted previously.

⁵ The World Bank, "GDP per capita (current US\$)", <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>, (Accessed 26 November, 2015).

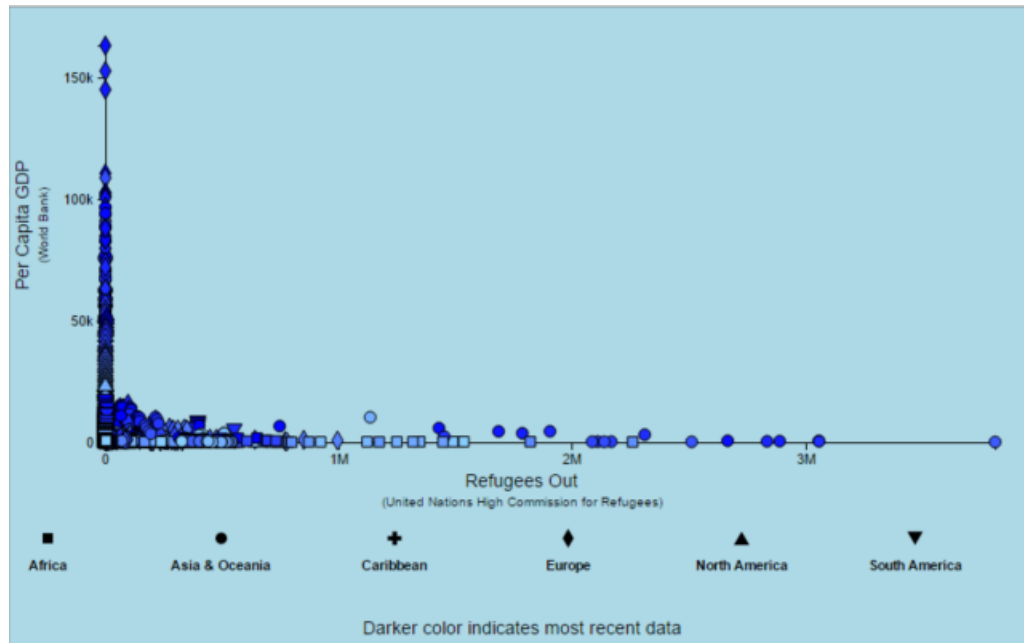


Figure 23: Refugee Outflow Numbers vs Per Capita GDP

Push Factors and Safety Needs

Transparency International has published the Corruption Perception Index (CPI) since 1995. The CPI is an indication of how corrupt a country's public sectors are seen to be.⁶ As stated by Transparency International "...corruption is a major obstacle to democracy and the rule of law."⁷ Rule of law is a necessary ingredient of a safe society, and safety is second only to physiological needs in Maslow's hierarchy. This indicates that a country's CPI should correlate with its ability to satisfy its population's safety needs. Paring a country's CPI score and exiting refugees for a given year results over 2000 data points plotted in Figure 24.

⁶ Transparency International, "Overview", <http://www.transparency.org/research/cpi/overview>, (Accessed 27 November, 2015).

⁷ Transparency International, "What is Corruption", <http://www.transparency.org/what-is-corruption/#define>, (Accessed 27 November, 2015).

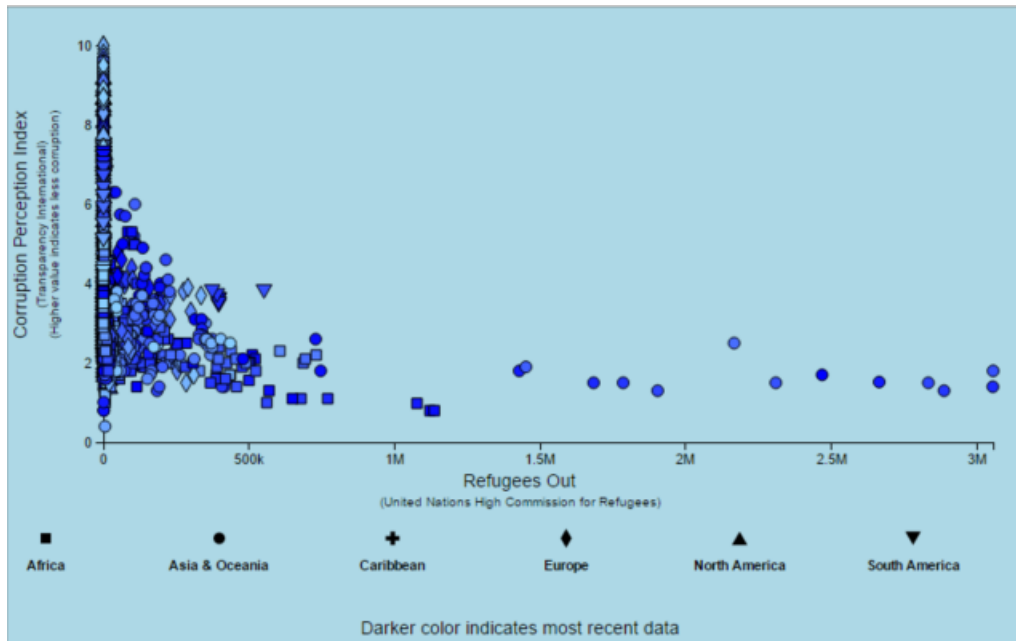


Figure 24: Transparency International's Corruption Perception Index vs Refugee Outflow Numbers

It is apparent that level of perceived corruption varies widely for countries experiencing low numbers of exiting refugees. However, as the number of refugees leaving increases, so does the level of perceived corruption. All countries experiencing a large exodus have high levels of corruption.

Push Factors Involving Multiple Needs

The United Nations' created the Human Development Index as a way to compare human capabilities across nations. They state that "The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone."⁸ It is a measure of a nation's achievements in the development of human capital and is calculated from information such as life expectancy, expected years of schooling, and standards of living. As a composite index it provides information across multiple levels of the hierarchy of needs. Figure 25 is a plot of refugee

⁸ United Nations Development Programme, "Human Development Reports", <http://hdr.undp.org/en/content/human-development-index-hdi>, (Accessed 27 November, 2015).

exodus numbers against HDI. It also shows that nations with the most migrants perform poorly.

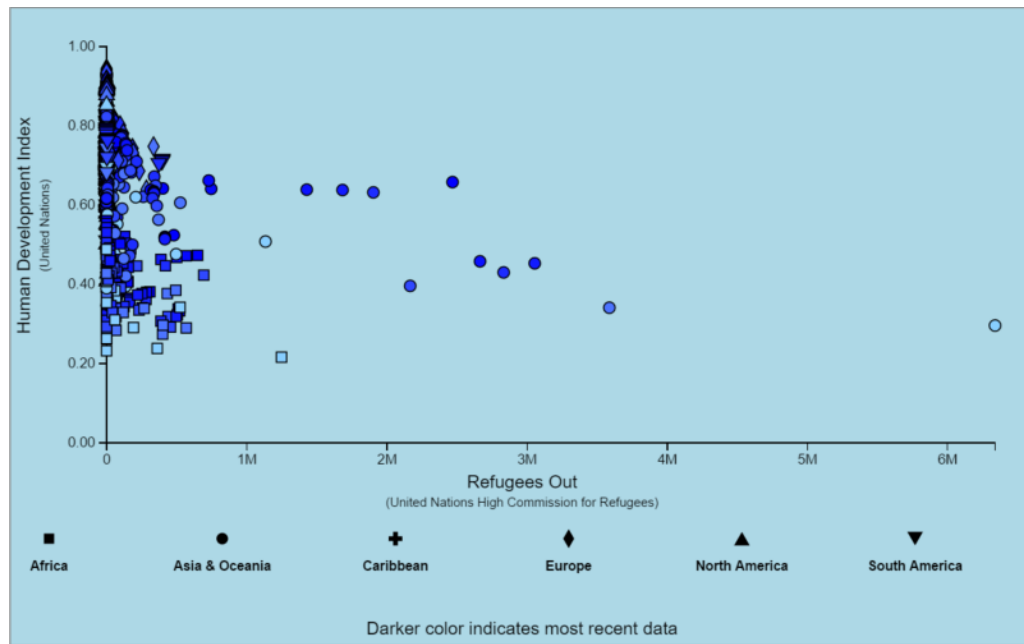


Figure 25: Refugee Outflow vs Human Development Index

Push Factors and Safety Needs

The effects of safety needs on migration can also be viewed in light of the presence of armed conflict. Uppsala University's Uppsala Conflict Data Program (UCDP) and the Peace Research Institute Oslo (PRIO) collect and publish the UCDP/PRIO Armed Conflict Dataset. This data includes information such as belligerents, location, and intensity for internal and external armed conflicts that resulted in at least 25 deaths in a one-year period since 1946.⁹ Figure 26 shows that the countries experiencing the greatest exodus simultaneously experienced conflict.

⁹ Erik Melander, "Organized Violence in the World 2015", Uppsala University, http://www.pcr.uu.se/digitalAssets/61/61335_1ucdp-paper-9.pdf, (Accessed 27 November, 2015).

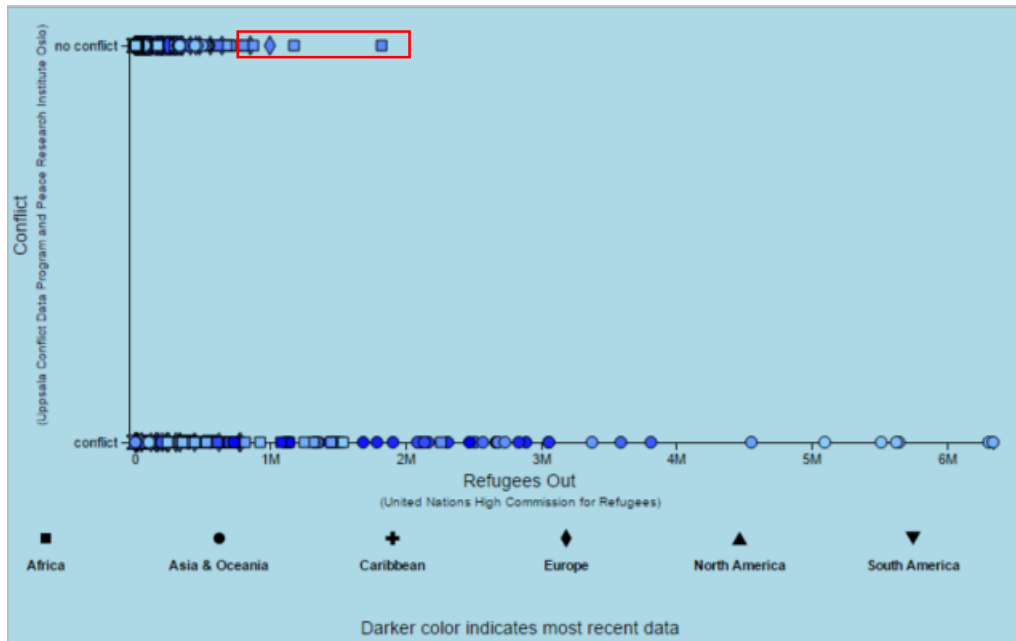


Figure 26: Uppsala University's Armed Conflict Data vs Refugee Outflow Numbers

The red box highlights several outliers that showed large migration while being absent of conflict. However, further analysis strengthens the connection between conflict and exodus. These non-conflict outliers include Rwanda in 1995, Mozambique 1993, the Burundian genocide of 1993, the 1994 Liberian Civil War, and Bosnia-Herzegovina 1996. All of these countries were in some state of internal turmoil or had experienced conflict the year prior.

Path Factors and the Effect of Proximity

Data shows that travel distance significantly influences migration patterns. While providing specific point to point distances for each refugee event is not possible, the distances between capital cities provides a useful proxy for migrant travel distance. University of Essex Department of Government professor Kristian Gleditsch publishes the distances between national capitals.¹⁰ His data allows plotting of refugee numbers as a function of distance.

¹⁰ Kristian Gleditsch, "Distance Between Capital Cities", <http://privatewww.essex.ac.uk/~ksg/data-5.html>, (Accessed 26 November, 2015).

Figure 27 charts the number of refugees and the distance those refugees traveled for over 70,000 data points over the past 30 years. Each point represents each refugee origin to destination pair in the UN Table of Refugees, and the travel distance value indicates the distance between the capitals of the origin and destination countries.

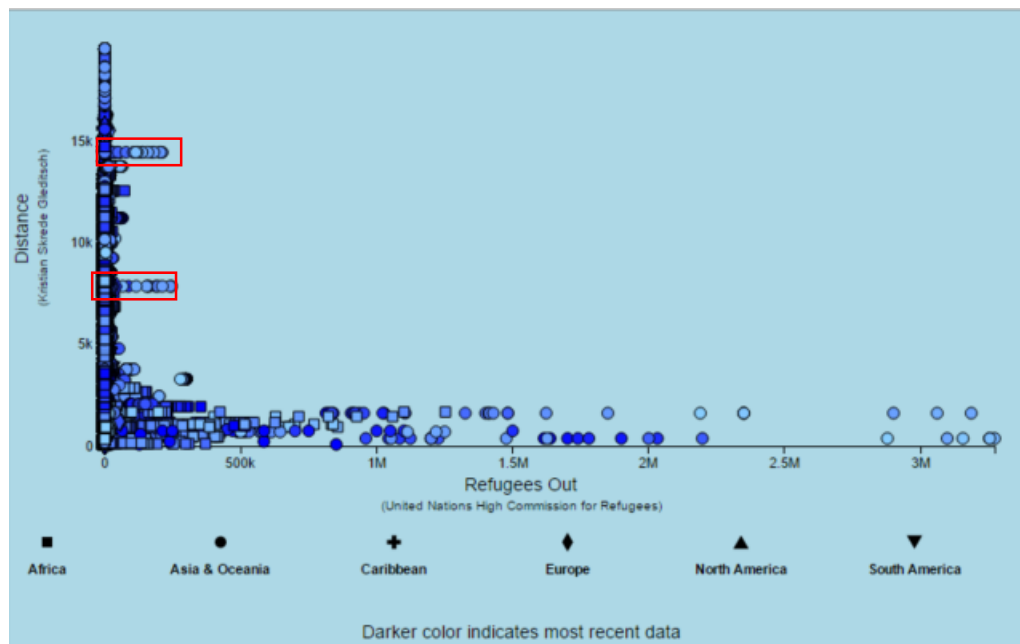


Figure 27: Refugee Outflow vs distance between capitals of origin and destination

The data shows large refugee migrations are a localized event while relatively small refugee events exhibit a large variety of migration distances. This data shows the vast majority of migrants are not likely to travel long distances.

However, there are two interesting groups of outliers in this chart; the horizontal lines of circles at approximately 14,000 and 8,000 kilometers. The top group shows large numbers of migrants from Vietnam entering the United States from in the 1980s and 1990s. The bottom group shows large numbers of Russian entering the US during the 1990s. The US's geographic isolation results in a distance spike whenever it takes in large numbers of refugees from outside the western hemisphere.

There are several potential reasons for migrants to prefer short travel distances. First, it is easier to travel shorter distances if other variables such as terrain and mode of travel remain the same. Additionally, migrants may desire to settle in an area that is culturally similar to their origin, and a nearby destination is more likely to be culturally similar than one that is significantly further away. Also, shorter distances have fewer intervening obstacles than longer distance travel. A shorter path is more likely to have fewer border crossings, changes in mode of travel, and be being less expensive.

Pull Factors

The search for pull indicators can be based on the assumption that refugees migrate to destinations that improve their chances of satisfying their needs. For example, refugees settle in countries that are safer or provide better economic opportunities than their origination. This assumption suggests that destinations will perform better than origin countries in the same indicators used in analyzing push factors.

Figures 28, 29, and 30 support this conclusion by showing that destination countries have higher per capita GDP, CPI, and HDI values than those seen in Figures 23, 24, and 25 respectively. However, it is just as apparent that a majority of refugees do not end up in countries that perform well in any of these indicators. Poor, corrupt, and under-developed nations still receive a large number of refugees. This is attributable to a combination of factors including porous borders, geographic proximity of poor nations, and cultural similarities between the migrants and the population of the destination country.

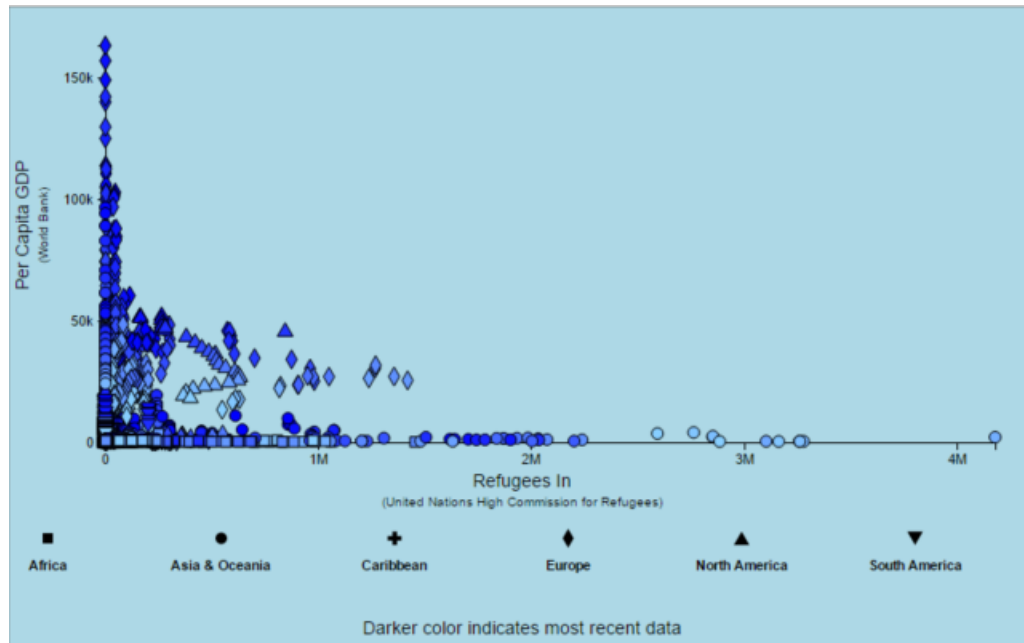


Figure 28: Refuge Influx vs Per Capita GDP

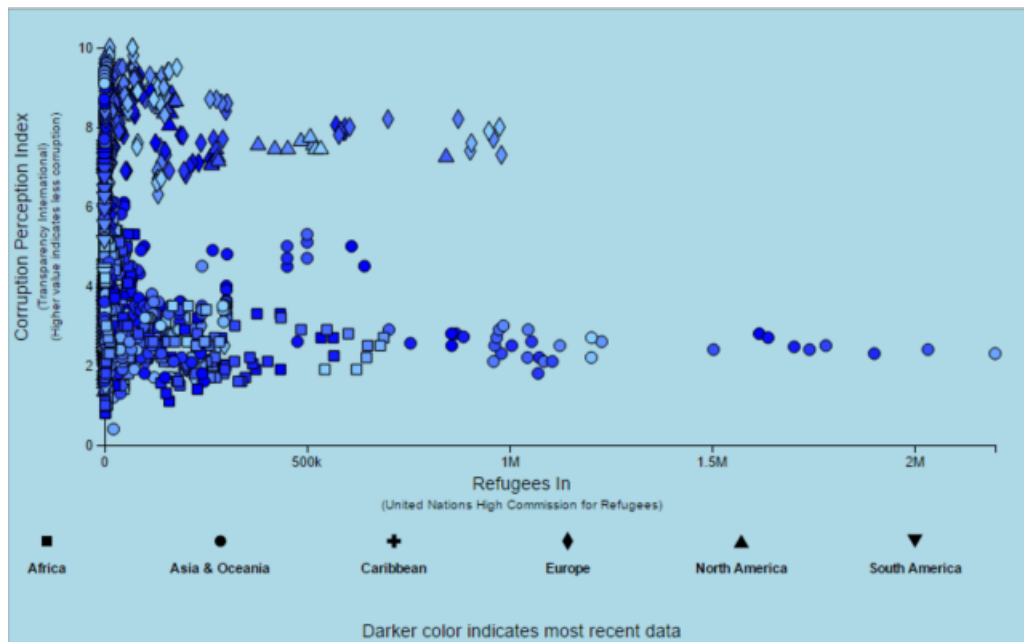


Figure 29: Refugees Influx vs Corruption Perception Index

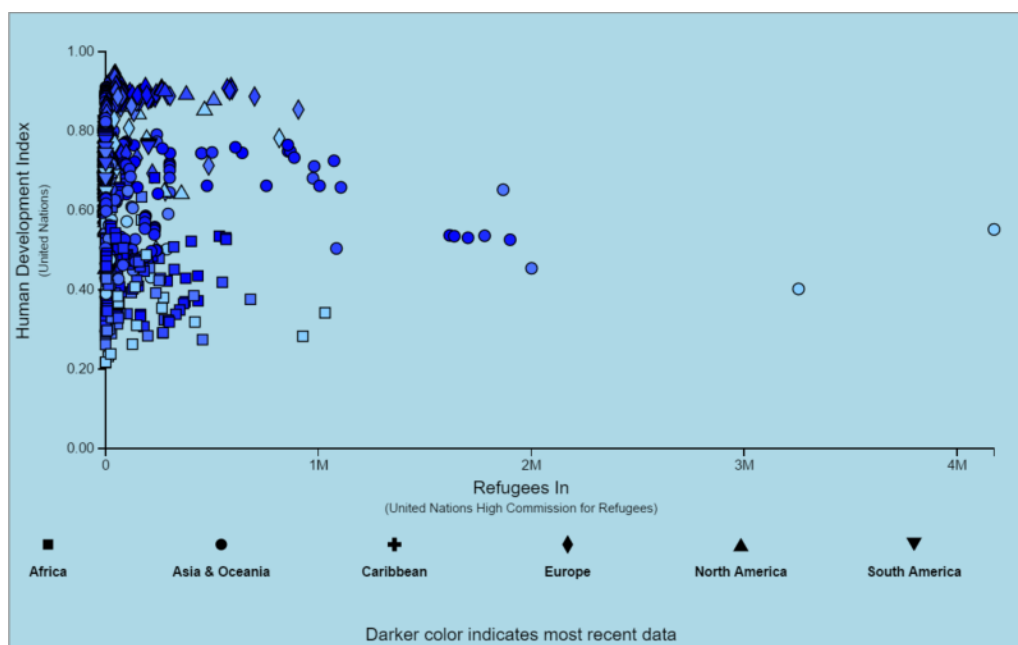


Figure 30: Refugees Influx vs Human Development Index

The underwhelming importance of GDP, CPI, and HDI relative to proximity as shown in Figure 27 may appear to fly in the face of conventional wisdom related to the ongoing European migration crisis. Reports may lead an observer to believe that the vast majority of Syrian refugees are attempting to enter Europe. However, the fallacy of this assumption is made clear when comparing the number of Syrian refugees in different countries. Between 2013 and November, 2015, there have been just over 140,000 resettlements pledged to date for Syrian refugees in Europe.¹¹ However, the UN counts over 4,000,000 registered Syrian refugees, and 98% of those are hosted in Turkey, Lebanon, Jordan, Iraq, and Egypt.¹²

The fact that the majority of refugees are in countries that share a border with the Syria supports the importance of proximity as a factor for determining refugee destinations.

¹¹ United Nations High Commissioner for Refugees, “Resettlement and Other Forms of Legal Admission for Syrian Refugees”, <http://www.unhcr.org/52b2febafc5.html>, (Accessed 27 November, 2015).

¹² “3RP Regional Refugee & Resilience Plan 2015-2016 In Response to the Syria Crisis”, <http://data.unhcr.org/syrianrefugees/download.php?id=9083>, (Accessed 27 November, 2015), 2.

The geographic closeness of these countries to Syria make them prime destinations for refugees.

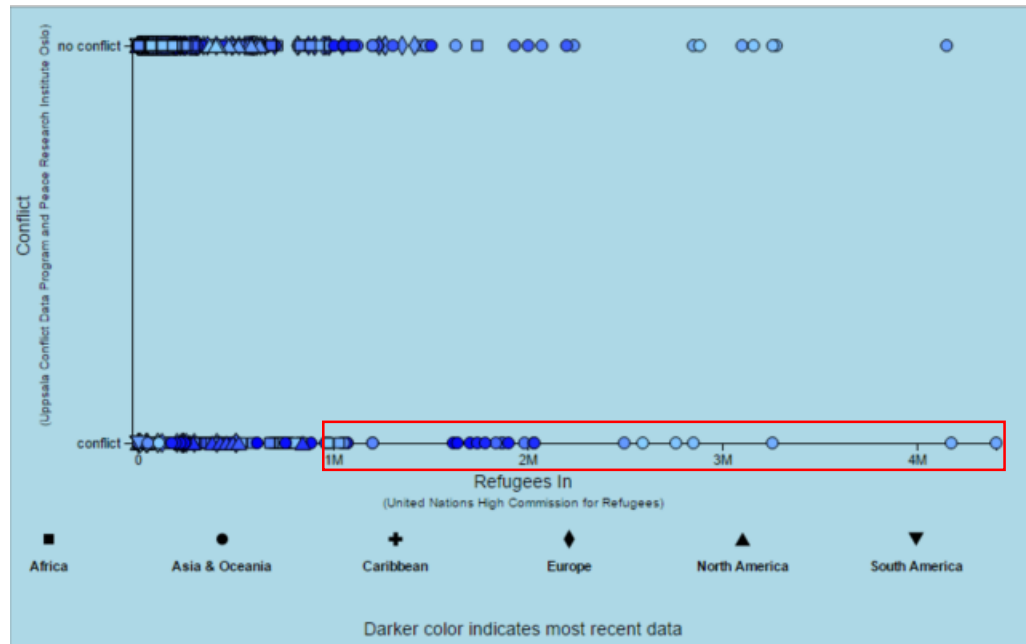


Figure 31: Refugees Influx vs Conflict Presence

Unlike GDP, CPI, and HDI, the presence of conflict does appear to have a significant bearing on whether a refugee identifies a country as a suitable destination. Figure 31 shows the tendency for refugees to migrate to places in which conflict is not present.

The correlation is strengthened by a discussion of several countries that show a large migrant influx while also being in a state conflict. The red box highlights 26 data points (out of over 3,900 total) showing influxes of more than one million refugees to places in which conflict is present. This is due to the broad definition of conflict used in the Armed Conflict Database (ACD). Each of those data points represent either Iran, Pakistan, or Sudan. The ACD counts ongoing disputes in each of these countries as conflicts. While each of these countries may have been experiencing some level of conflict at the time the data was recorded, each also possessed relatively safe areas that were free of overt conflict.

Causality or Correlation

It must be kept in mind that the order of causality for the indicators and migration events is not implied in this analysis. It is possible that the situations identified by the indicators may result in a migration. For example, situations resulting in poor performance in an indicator may result in a migrant exodus. However, it is also possible that a population exodus can result in decreased indicator performance as the people responsible for maintaining a country's economy and rule of law leave. The determination of cause and effect is a subject worthy of further research.

However, the viability of using indicators is not dependent on the determination of causality or correlation. Causation is not a requirement for a viable model warning of mass migration events. Correlation between the indicators and migration is all that is needed to provide forewarning of the presence of conditions conducive to a mass migration event.

Chapter 6: Conclusion

As stated previously, the decision to leave one's home is a very personal one. The threshold of perception for satisfying one's own hierarchy of needs varies for each individual. This human element must not be forgotten when drawing conclusions from the statistical data presented in this paper. This is an example of the adage that "Not everything that can be counted counts, and not everything that counts can be counted."¹ The human ability to persevere in relatively poor conditions is repeatedly shown in the data presented herein, and it has been repeatedly demonstrated that not all poorly performing states experience mass exodus.

However; with those caveats in mind, the data presented allows the reader to draw several conclusions about the characteristics of migration events:

- The reasons for migration have not changed. Physiological, safety, and economic needs still dominate the reason migrants migrate.
- A mass migration is more likely to originate from a country with an underperforming economy as indicated by a low GDP per capita.
- A mass migration is more likely to originate from a country with a high level of lawlessness and corruption as indicated by the Corruption Perception Index.
- A mass migration is more likely to originate from a country involved in a conflict as defined by Uppsala University's Armed Conflict data.
- Refugees tend not to travel long distances. However, geographically isolated, but highly desirable destinations such as the United States are exceptions to this rule if a suitable path is present.
- Refugees tend to settle in countries that are more lawful and less corrupt relative to the country they originated from.
- Refugees tend to settle in countries with better economies relative to their origin country.
- Refugees tend to settle in a country that is not experiencing an armed conflict.
- The level of situational improvement between the country of origin and destination country does not have to be large. Refugees do not necessarily settle in the location that offers the highest income, or safest environment. In fact, the data show that the largest refugee influxes routinely target countries with low per capita GDPs.

¹ William Cameron, "Informal Sociology, a Casual Introduction to Sociological Thinking", Random House, New York, 1963, 13.

- All countries that experienced a migration exodus performed poorly on one or more indicators. However, not all distressed countries experienced mass migration events. The data show that there are multiple countries that have not experienced a migration exodus even though they possessed qualities detrimental to satisfying human needs. This relationship can be described as follows:

All countries that experience a mass migration event perform poorly in one or more indicators; however, not all poorly performing countries experience a mass migration event.

In conclusion, there are indicators available that can aid in raising awareness of the increased likelihood of a migration event, as well as provide insight into their characteristics. Additionally, the existence of the open source indicators presented in this paper suggests that other, more effective indicators may be available. Furthermore, the data recorded in these indicators may be available prior to their open publication. The information included in these databases is constantly evolving based on current events, and frequent and rapid data accumulation and dissemination is key to performing predictive vice post event analysis.

While the information provided in this paper does not present a complete predictive solution, it does provide a foundation for greater understating of factors underpinning a mass migration event. A combination of more comprehensive analysis and data that is more complete, current, and readily available will provide decision makers and planners with better information to assess current and potential mass migration events.

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Vita

CDR Reginald Johnson is a 1999 graduate of Old Dominion University where he received a Bachelor's of Science in Computer Science. After being commissioned through the NROTC program he proceeded to NAS Pensacola to where he completed initial Naval Flight Officer training.

From there he joined the "Greyhawks" of VAW-120 in Norfolk, VA, and received his Naval Flight Officer wings in 2001. He then did a tour with the "Bear Aces" of VAW-124 where he deployed in support of Operation IRAQI FREEDOM. Next, he returned to VAW-120 as an instructor as well as an Individual Augmentee for a six-month tour to Kabul, Afghanistan. He then reported Afloat Planning System Atlantic and then Second Fleet as a Tomahawk Mission Planner.

After being selected for VAW Department Head, he joined the "Golden Hawks" of VAW-112 in Point Mugu, CA. There he served as Safety Officer, Administrative Officer, and Operations Officer and did two deployments in the PACOM and CENTCOM AORs.

Most recently, he studied at the Naval Postgraduate School in Monterey, CA where he earned his Masters of Science in System's Engineering Analysis.