Impact of Immigrant Origin Home Country Level of Financial Access and Inclusion on Immigrant US Financial Literacy Scores

Honors Undergraduate Thesis

Presented in Partial Fulfillment of the Requirements for the Degree with Honors

Research Distinction in Finance in the Fisher College of Business of The Ohio State University

By

Mary Conway

The Ohio State University

2020

Thesis Committee:

Dr. Sherman Hanna (Faculty Advisor)

Dr. Andrea Prud'homme (Faculty Adivsor)

Dr. Catherine Montalto

ABSTRACT

Success in the United States is determined by financial success and security, both heavily related to an understanding of basic finances. The lack of financial literacy around the world has been studied in more detail since the early 2000s, but the majority of studies look at impacts of lack of financial literacy rather than factors leading to varying levels of financial literacy. Having a high level of financial literacy roughly means having an understanding of credit, banking and saving. This is especially important for immigrants in the United States without support systems. Immigrants on average are less financially literate than non-immigrants. To look beyond simply immigrant status, this study examines how immigrant's scores on financial literacy exams are related to their home country level of financial inclusion in an attempt to control for the status of the country of origin. The World Bank's Global Findex Database was used to measure inclusion. The database measures the percentage of the population that have a financial account in a bank, microfinance account, or other financial account in 148 different countries. We believe greater access to financial institutions will lead to higher financial literacy test scores in the US, as observed by the Understanding America Study's financial literacy database. This database measures household characteristics, financial literacy scores, and demographic factors for approximately 7000 people. When measuring the impact of immigrant status, home country financial inclusion and controlling for education, age and gender, the level of financial inclusion is always statistically significant. Without immigrant status as a factor, inclusion is very significant and when run with immigrant status, is loses some significance but remains a good indicator of success on financial literacy exams. While the Understanding America Study does have limitations (it does not list the age of immigration, or allow for information about home country education, income or social standing), this exploratory study shows that country of origin access to finances should be a factor considered in policy and education for immigrants.

Keywords: Financial Literacy; Immigrants; Understanding America Study; Global Findex Database; Index of Economic Freedom; Financial Inclusion

<div align="center">**VITA**</div>

May 2015   Columbia High School

August 2020   B.S.B.A. Finance, The Ohio State University

August 2020   B.A. Russian Language, The Ohio State University

TABLE OF CONTENTS

LIST OF TABLES/FIGURES

INTRODUCTION

Efforts towards improving financial literacy have been made since the Internet Bubble Crash in the early 2000s. In 2003, the US Government created the Financial Literacy and Education Commission under the Fair and Accurate Credit Transactions Act to "… sustain financial well-being for all individuals and families in the U.S…. by setting strategic directions for policy, education, practice, research, and coordination so that all Americans make informed financial decisions." (Financial Literacy and Education Commission, 2003) Since the Great Recession in 2008, there has been an increased level of attention placed on financial literacy education. (USA Today, 2013) As of 2018, at least 28 state mandates have emerged to compliment this federal program, and local nonprofits and communities have created their own programming to serve their specific needs. (Morton, 2018)

Unfortunately, recent studies have shown that financial literacy skills have decreased since 2008. Between 2009 and 2018, there was an 8% decrease in the number of people who could correctly answer questions about interest, savings, and credit. This decline is most prominent in certain populations, such as young earners and African American men. The generational gap is being even stronger despite the legislation and efforts in 2009 and 2010. (Keshner, 2019)

Certain factors have been determined to influence financial literacy, such as income level and education (OECD, 2006). However, trying to better understand why some people have differing levels of financial literacy is a current hot policy and research topic. Research and work are being done currently to try to understand what policies would combat underlying challenges.

Financial literacy has been studied in a variety of surveys and databases over the past 20 years or so, including the Understanding America Study, which contains data from over 7,000 respondents on a 14-question financial literacy exam and includes some demographic data. These studies are widely used in research and policy to determine how best to help increase financial literacy in the United States.

Research has examined why financial literacy is important, how being financially illiterate can negatively impact an individual, and the relationships between financial literacy levels and household factors. There have also been some discussion as to why some of these relationships might exist. Other research has been done to understand differences of the accumulation of financial literacy between populations, and to determine how immigrants differ from non-immigrants. Most of these studies have been completed outside of the United States and with very specific immigrant populations. Or, they have studied how immigrants use remittances, and how various educational information about financial resources is passed through the community.

This research is the first to study that we know of that investigates how levels of financial access and inclusion, as measured by the relatively new World Bank Findex Database, are related to financial literacy test scores specifically for immigrants. While trying to find a way to control for the status of a country of origin, we decided to look at financial inclusion after considering levels of economic freedom, GDP/capita, poverty levels, GNI/capital, World Bank income classifications as financial inclusion gives a better look at individual and personal access to financial institutions and banking. We feel like financial inclusion is also very heavily related to many of the above factors and by looking at levels of financial inclusion we were able to compare countries to the United States.

When considering how to measure inclusion, we first considered sorting countries into groups or looking at individual countries, but we did not have a large enough sample set. There were a number of countries that only have one respondent. At first we found the Financial Freedom Index, a part of the Index of Economic Freedom, a widely used and studies index of economic freedoms. Eventually, we found the World Bank's Global Findex Database, an index that looked more at individual and personal financial access rather than business access like the Financial Freedom Index. The results of the study with the Financial Freedom Index are in the Appendix while the study was completed using the Global Findex Database as this research focuses on immigrants' personal access to financial institutions and how this access measures against the differences between immigrant and US born backgrounds.

Results show that home country levels of inclusion matter when determining financial literacy in the United States. While the immigrant experience is still statistically significant, factors relating to financial inclusion at home are more important and better predictors of financial literacy. This will impact financial literacy programming and force organizations and policymakers to acknowledge that one-size-fits-all programming is not enough to help assimilate all immigrants and refugees into the US financial systems. Consideration of past knowledge and access to financial institutions when creating teaching material and stipulating hours continuing education needed will lead to increased financial literacy among the immigrant population. Financial firms should also take this into consideration when working with clients who are immigrants. Resources should be offered comparing US offerings to offerings from their home countries, and surveys should be done in advance to determine how much access immigrants have had to financial institutions in the past.

LITERATURE REVIEW

Financial Literacy Definition

In research over the past decade, there has not been a single definitive definition of financial literacy. Researchers have used the terms financial literacy, financial knowledge, and financial education interchangeable and without efforts to differentiate between these terms. There are also currently no standardized methods to measure financial literacy, despite this concept's current popularity and importance. (Huston, 2010)

For the purpose of this paper, the definition of financial literacy used by the National Financial Educators Council is used. They define financial literacy as "possessing the skills and knowledge on financial matters to confidently take effective action that best fulfills an individual's personal, family and global community goals". (Council, 2019)

With US financial systems becoming more and more complex, there is greater need to understand how capable people are of understanding, properly responding to, and undertaking certain financial decisions. With the most recent financial crisis, consumer credit and mortgage borrowing have faced extraordinary growth and changing standards and criteria. Alternative financing options like payday loans have also become more widespread that they were in recent decades. Also, changes in pension systems have required individuals to save and invest more for retirement than workers in the past. The combination of these factors makes the US financial system riskier and harder to understand than ever before. (Mitchell, 2014)

While one theory behind suboptimal financial decisions is the lack of financial literacy, specifically within certain populations, other explanations for suboptimal financial decision making include impatience or present bias. A recent article based on experimental evidence in Chile finds that patience, and not choosing immediate gratification over larger long-term payoffs, is highly correlated with wealth. Financial literacy seems to also be correlated with wealth but is a weaker predictor. (Hastings, 2020)

While impatience and a preference for a short-term focus might have a higher predictive value, it is much harder to combat than low levels of financial literacy. Efforts are being made to make the US consumer more financially literate, allowing individuals to build wealth and build the US economy. "From a policy perspective, it is important that consumers have a clear understanding of the US financial system and credit markets so that they can make sound financial decisions." (Rhine, 2006) When citizens and immigrants are illiterate, optimal, wealth creating financial decisions are not made.

<div align="center">Financial Literacy and Immigrants</div>

Regarding immigrants and refugees specifically, there have been a variety of studies over the past 15 years determine which factors influence financial success in the United States. Immigrants are immediately expected to make financial decisions and transactions upon arrival to the United States. How familiar immigrants are with the US financial system could be a determinant of financial literacy and success. (Rhine, 2006)

Immigrants with less education, poverty-level income, and/or larger families are more likely to be "unbanked", meaning not to have bank accounts, while immigrants with higher incomes or greater net worth are more likely to have bank accounts both in the United States and in their home countries. The socioeconomic trends linked to being unbanked might be related to lower financial literacy abilities. (Rhine, 2006)

Regarding immigrant financial literacy specifically, according to the World Bank Economic Review "the lack of financial literacy among migrants has been identified as one potentially important barrier to competition and new production adoption." (Gibson, 2014) There is significant research that points to immigrants being a relatively untapped market for financial services. (Correal, 2016) This shows the importance of having financially literate immigrants in the United States, both so that they can make optimal financial decisions and to provide new markets for business.

The impact of immigrant financial literacy has not been studied as in-depth in the United States as in other countries. Within the past 10 years, there have been a number of studies in Australia and South Korea that specifically compare immigrant populations to each other to determine which factors might impact how quickly immigrants gain financial knowledge of their new country, how vast the differences are between groups, and what best practices might be when considering how best to teach different populations about financial systems.

Levels of access to, and knowledge about, financial systems differ according to education levels attained, but also are impacted by cultural behaviors. It is important to consider the impact of such a group of people on the country's overall financial system when considering why it is important to provide culturally relevant, individualized, and effective education. Whether immigrants trust their home institutions or not is an important to understand when considering immigrants' tendency or willingness to use financial services in their new country. (Zuhair, 2015)

A recent South Korean study confirmed that home country financial systems heavily impact the acquisition of financial knowledge by an individual. By studying the financial literacy differences between North Korean refugees and native-born South Koreans, the importance of institutional environments in developing financial literacy was discovered, even after controlling for cognitive ability and cultural similarities. (Kim, 2017)

While much of this research proves that immigrants are on average less financially literate, the areas studied to explain this tendency do not provide a full picture of the different backgrounds and factors leading to this lower level of financial literacy. The institution study in South Korea shows that institutional access is important but uses the very extreme example of North versus South Korea, a deeper look at institutional differences would provide a broader look at how many institutional differences impact many different financial literacy levels. Financial inclusion is a way to account for these institutional differences that goes beyond simple economic approaches like GDP/capita, but also factors

in things like the freedom of movement to get a bank account, the trust people put in institutions, the politics of a market economy, and economic need for institutions.

Measuring Financial Inclusion

Having determined that immigrants on average have a lower degree of financial literacy than non-immigrants, it is important understand other methods of measuring the impacts of financial inclusion.

The consensus from a policy perspective is that financial inclusion includes outreach, financial usage, and quality of financial services. Outreach means the physical ability to easily reach the service, usage refers to the frequency of use, and quality refers to the extent to which financial services and institutions address consumer needs. (Amidzic, Massara, Mialou, 2014) While the definition of an "institution" has varied over time according to different scholars, (North, 1990; Rutherford, 1995; Acemoglu, et al. 2001; Persson, 2004), there is now an academic agreement that institutions are important to economic growth and personal economic success and are linked to financial inclusion (Aron, 2000; Zulkhibri, Chazal, 2017) Financial inclusion is a factor that directly impacts economic involvement, success, growth and the reduction of poverty levels. Institutions and infrastructure directly impact inclusion. Financial literacy and staff development in financial institutions may directly influence inclusion. (Agyekum, 2017) The benefits from financial inclusion include improving earning potential, reducing poverty, increased savings in women-headed households, and decreased financial risk. (Demirguc-Kunt et al. 2017) High levels of financial inclusion are linked with both fewer individuals under the poverty line and less poverty in the macro economy. (Omojolaibi, 2017)

Inclusion Indices

While the Economic Freedom Index by the Fraser Institute is considered the premier economic freedom index (Hall, Lawson, 2014) the index does not have as comparable a measure of institutional and financial access as the Index of Economic Freedom. Both indices are highly correlated with each other in terms of overall results. (Hall, Lawson, 2014) The Economic Freedom Index ranks countries based on the size of

the government, legal systems and property rights, sound money (having a stable money supply), freedom to trade internationally, and regulations versus 10 different areas in the Index of Economic Freedom. (Fraser Institute, XXXX) While the Fraser index measures business access and regulation, the Index of Economic Freedom also measures access to securities and insurance, financial instruments and banking. (Beach, Miles, 2006)

The Heritage Foundation's Index of Economic Freedom has been used as a measure of financial inclusion and economic freedom in a variety of studies. The Financial Freedom Index was used as a major factor and proxy for inclusion in the creation of the Financial Development Index to predict the relationship between financial development and human capital in 21 developing countries in Asia. (Arora, 2012) Three metrics in the index (financial, business, and monetary freedom) have been used to examine and show how economic freedom influences financial inclusion. (Zulkhibri, Chazal, 2017) Business freedom is used to create financial inclusion sensitivity models to examine inclusion's impact on Nigeria's poor. This study concluded that financial inclusion is linked to investment in financial institutions and per capita Gross Domestic Product (Omojolaibi, 2017) The index has been used extensively to observe the impact of aim from the International Monetary Fund on economic freedom. (Knedlik, Franz, 2007) The financial freedom metric in Sub-Saharan Africa from the Index of Economic Freedom is a better determinant of financial inclusion than reserve or liquidity ratios. The financial freedom metric is used as a proxy for institutional independence from government control and interference in the financial sector. (Abdulmumin, 2018) The Index of Economic Freedom is also widely used in other subject areas such as happiness studies and when measuring the impact of institutional inclusion on subjective well-being. (Spruk, Keseljevic, 2016; Bjornskov, Dreher, Fischer, 2010)

The Global Findex database has only been published 3 times, starting in 2011, but is growing to become more widely used in the academic community. This database is considered to be behind a recent boom in new research thanks to the Global Findex's ability to distinguish between the usage of financial services versus access by individuals, allowing researchers to probe deeper into individual financial inclusion

levels. (Zulkhibri, Chazal, 2017) It is especially useful when measuring banked versus unbanked individuals. (Demirguc-Kunt, Klapper, 2012)

The Global Findex database has also been used to study financial inclusion, institutions, and governance in Muslim developing countries. In these studies, strong institutions have high statistic significant with higher levels of financial inclusion, especially for poorer segments of society. Financial inclusion is viewed as an important factor in combatting poverty and addressing sustainable development goals. Studies in poverty reduction and economic development suggest that financial inclusion matters and a lack of access to finance leads to poverty traps and inequality. (Zulkhibri, Chazal, 2017) The Global Findex Database has recently been used to examine the impact of gender on formal financial inclusion and access to banking in Colombia. (Cardona-Ruiz, Hoyos-Alzata, Saavedra-Caballero, 2018) Member states at the United Nations have begun to use the 2017 Global Findex Database to track progress towards the Sustainable Development Goals. (Demirguc-Kunt et al. 2017)

We didn't find studies specifically examining immigrants in the United States or studies using inclusion and access to financial institutions as an independent variable. Researchers have acknowledged and discussed that immigrants are on average less financially literate and looked at the results of these lower levels of financial literacy but have not generally looked in-depth as to why they might be less financially literate. Basic research has been done to examine the impacts of education, income, age, and gender, but not much further than examining these factors. This study will fill that gap to look beyond only immigrant status and certain demographic factors in the United States by also looking at their home country level of financial inclusion.

METHODS

Dataset and Sample Selection

As discussed above, while no standardized method exists for measuring financial literacy, for the purpose of this paper, the Understanding America Study method of measuring financial literacy was used. The Understanding America Study (UAS) is a nationally representative Internet panel of more than 7000 adults that examines financial well-being, psychology, and cognitive ability. The study is conducted by The Center for Economic and Social Research at the University of Southern California and is supported by the Social Security Administration and the National Institute on Aging. The study has been one of the richest sources of data on financial literacy since its inception in 2014.

Participants are selected by their addresses and compensated for their time. The UAS is unique in that it solely selects first batch participants based on their addresses, and then uses Sequential Importance Sampling (SIS) to adapt subsequent sampling to make up for discrepancies in current samples. The answers are all weighted by US population to give the most accurate data possible.

The UAS1: Financial Literacy; Personality; Understanding Probabilities; Numeracy study specifically was used, as it captures financial literacy understanding from 7059 respondents over a four-year period.

The full survey data for UAS1 was downloaded from the UAS website. Then, incomplete data sets are removed. Meaning datasets where the respondent didn't answer all the financial literacy questions, didn't list their gender or income, or weren't from countries listed in the Global Findex Database. 6,882 respondents remained after taking out the incomplete data sets. Of these 6,882 respondents, 541 respondents were not born in the United States and considered immigrants. The other 6.341 respondents were born in the United States. These immigrants in the database come from many different countries, but we can systematically control for similarities to financial inclusion as in the US by examining each individual county and its level of inclusion compared to the US

Financial literacy was measured using the answers to the 14 financial literacy questions asked in the Understanding America Study. The data was coded so that for each correct answer, each participant received a 1. If the participant didn't answer correctly, or answered "Don't know", the participant received a 0. The maximum score on the financial literacy questions would be a 14, meaning that participant answered every question correctly. A 0 would signify that the participant did not answer any questions correctly. Which a few questions were randomized (meaning the A, B, C answers would change for each respondent), it was possible to determine in the dataset which answer would be correct for each participant based on which version of the question they were given.

Focal Independent Variables

Immigrant Status

Respondents were asked to self-identify if they were immigrants or not in the Understanding America Study. Respondents respond either yes or no to whether they are immigrants, as well as to the questions if they were born in the United States or not; a number of respondents did not answer the original question but did mark the United States as their birth country. These respondents were marked as "not immigrants". Also, respondents who marked that they were immigrants, but did not mark their country of birth were removed from the study for the sake of being able to compare each respondent to their country of origin's inclusion information.
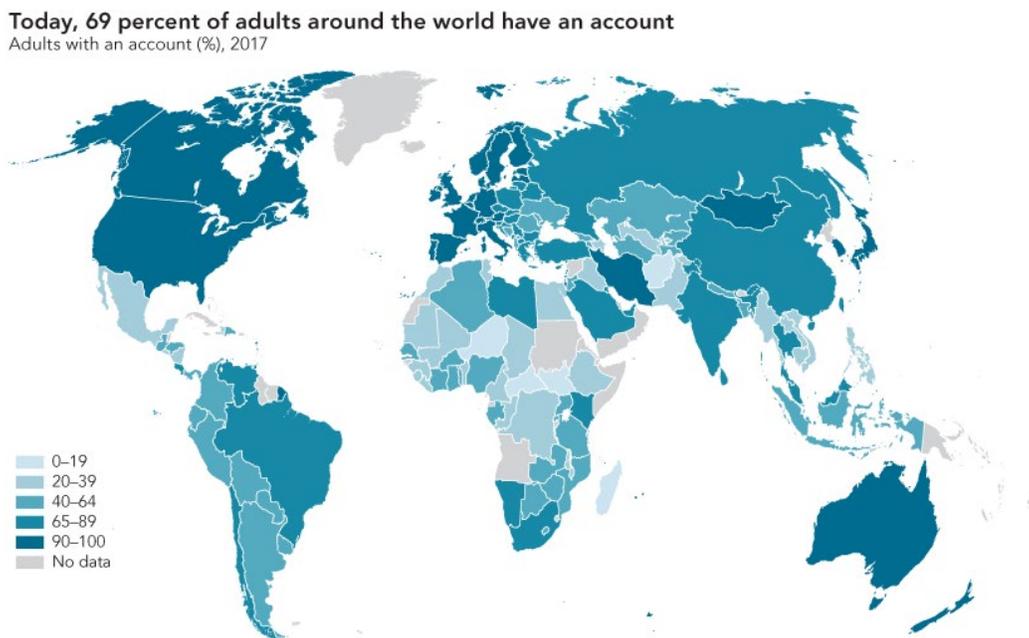
Financial Inclusion Proxy

Global Findex Database

After further research, the Global Findex Database was found to be a newer, objectively better proxy for individual financial inclusion and access. Up until this database's creation in 2011, little had been known about the extent of financial inclusion and the degree to which specific groups such as women, poor, and

youth are excluded from these financial institutions. The Global Findex Database uses a variety of

indicators to measure how adults in 148 economies use funds to borrow, save, manage risk, and make

payments. More than 150,000 nationally representative and randomly selected adults 15 years old and

above were surveyed in 148 countries to create this dataset. Some of the 850+ specific indicators include

the percent of the population that has an account at a financial institution, reasons why they do not have

an account, saving account access, as well as usage of ATMs, checks, and online banking. (Demirguc-

Kurt, 2012) Below is a map of all the countries the Global Findex Database collects information in and

the countries' inclusion factors (meaning the percent of the population over the age of 15 with bank

accounts). [FIGURE 1] Below this map is a graph that shows the countries with the highest number of

immigrants in the UAS and the percent of the population in these countries with access to financial
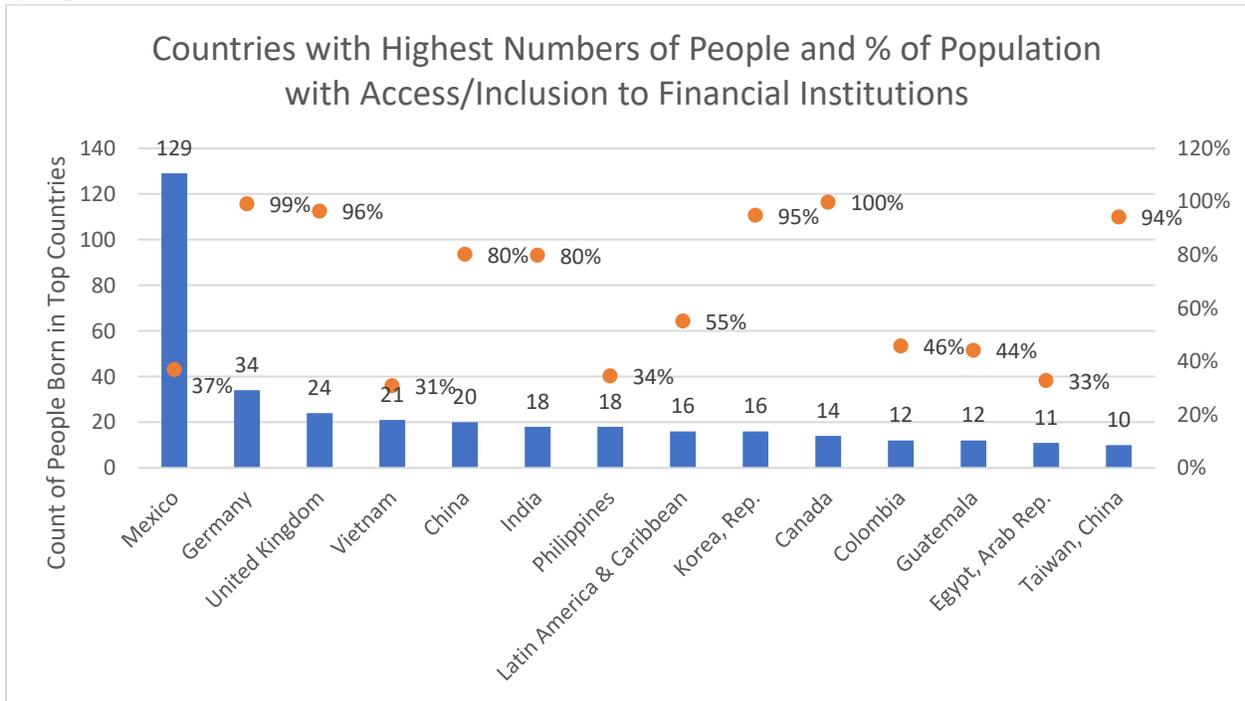
institutions in the Global Findex Database. [FIGURE 2]

FIGURE 1
Percentage of Population with Financial Account per Country - 2017

FIGURE 2

Countries with Highest Number of Immigrants in the Understanding America Study and their Percentage of Population with Access and Inclusion in Financial Institutions in the Global Findex Database

This database has been published every three years since 2011 (2011, 2014, and 2017). The data is collected in partnership with Gallup Inc. and funded by the Bill and Melinda Gate Foundation. For the purpose of this research, the only factor used is the percent of the population in each country that has an account with a formal financial institution, whether that be a bank, a microfinance institution, or another type of regulated financial institution in the 2017 database. This one number is used as a proxy for access to financial institution in the 148 countries, as it can be seen as a reasonable proxy for access and inclusion in financial institutions. (Demirguc-Kurt, 2017)

Financial Freedom Index

This is the original index that was explored in the study. When the Global Findex Database was discovered and found to be objectively better suited for the question trying to be answered, the research

was run again using the second database. The results using the original database are included in the Appendix for reference but are much less significant than the results using the Global Findex Database.

Understanding America Survey – Weight, Control Variables and Limitations

Weight

The survey data is weighted in two parts. First, a base weight is created to account for the SIS algorithm causing the probability of being sampled to vary from one zip code to another. The zip codes are weighted to match their characteristics (Census region, urbanicity, sex, age, education, race, and marital status) with those in the Census Bureau's American Community Survey. Then, the final weight is determined to correct for differential survey nonresponse weights to align with economic and demographic variables. The Census Bureau's Current Population Survey Annual Social and Economic Supplement is used as a benchmark for the population distribution.

Even with weighting, the survey more heavily represents US-born people than are in the overall US population. There are large differences in distributions of citizenship, place of birth, and marital status. The survey also indicates UAS panel members are slightly more likely than the US population to be self-employed and/or unemployed and to have a postgraduate education. (Gibson, 2014)

Control Variables

The set of control variables included age of respondent, gender (female, male), education (less than high school, high school diploma, some college, bachelor's degree, post-bachelor's degree), and household income. The education category was first coded by estimating the number of years spent in formal education from each of the categories listed in the survey. The purpose of this coding was to not assume a linear relationship from each step up in original education level. It would not be correct to assume that a

one-step increases from "1 Less than 1st grade" to "2 Up to 4th grade" would have the exact same effect as a one-step increase from "13 Bachelor's degree" to "14 Master's degree".

Limitations

The Understanding America Study does not give information about when immigrants came to the United States. This lack of information makes it hard to accurately measure how country of origin might impact current levels of financial literacy. An immigrant from China 40 years ago would have a much different understanding of personal finance within the context of the US than an immigrant from China 4 years ago. The intense development of various countries has drastically changed the types of home country institutions and access to education about financials and institutions which would also impact the level of financial literacy for individual who migrated at different times. One could infer time of immigration based on age, but this is a very rough and imprecise measure of age of arrival.

The Index of Economic Freedom and the Global Findex Database also specifically measures Financial Freedom and the percent of the population with accounts at financial institutions in the country of origin in 2019. Not being able to specifically match the year of immigration to the scores or percentages for that specific year means that we will not be able to accurately measure levels of financial inclusion and access in the home country. Thus, only a rough, exploratory study can be attempted using the Understanding America Study.

Also, the UAS does not have a representative measure of immigrants from different countries. There are many immigrants from Mexico, but very few from other countries. For example, there is only one respondent from Palestine. Not having a representative survey that reflects the actual distribution of immigrants from various countries in the United States complicates the study.

By using only a proxy index to account for differences in immigrant financial literacy, we are not accounting for different immigrants levels' of financial status, position, or education in their countries of origin. The study is limited in its ability to differentiate between immigrants and thus makes a broad

claim due to our inability to control for these original positions in countries of origin. By no means are all immigrants the same, but the study does not have a definitive way to measure these original differences.

Analysis

Logistic Regression Models on Financial Literacy Scores

This study utilized logistic regression models to analyze the relationship between financial literacy knowledge and immigrant country of origin level of financial access and inclusion, controlling for various household characteristics. We expected that the inclusion of both immigrant status and the Global Findex Database inclusion variable would provide some insight into factors that might influence immigrant financial literacy and allow for better educational programming. In order to test the explanatory power of considering country of origin financial inclusion and access, we constructed a hierarchical model as follows:

Model 1, Baseline Model - Immigrant Status without Global Findex Database

> Meant to confirm that immigrant status has an impact on financial literacy scores at all.

Model 2, Global Findex Database without immigrant status

> Looking at how much of an impact the inclusion factor (Global Findex Dasabase) has without immigrant status to take significance away. Meant to be used to look at effects of multicollinearity.

Model 3, Immigrant Status and Global Findex Database

> Combines immigrant status and the inclusion factor to see how the different factors compare to each other now that their individual statistical significance is proven.

Model 4, Only Immigrants and the Global Findex Database.

Looking at how the inclusion factor predicts financial literacy scores for just the immigrants in the database.

RESULTS

Descriptive Results

Table 1 shows descriptive results for all respondents and for immigrants specifically. Roughly 8% of respondents identified as immigrants. The immigrants have a lower mean score on the financial literacy exam than the mean of all respondents but a similar standard deviation. The Inclusion mean is much lower for immigrants than the average for all respondents as well as has a much greater standard deviation. This suggests that on average immigrants have much less access to financial institutions and that the types and varieties of institutions and usage of institution are varied. The natural logarithm of income is also lower for immigrants than for all respondents with similar levels of standard deviation. Education levels vary the most between the averages and immigrant education levels, though not by as much as might be expected. The larger percentage of those with post-bachelor's and bachelor's degrees than would be expected compared to the general US population might skew the data towards higher earners. Overall, though, there are both more immigrants with a lower level of education and more with a higher level of education that the average of all respondents in the US Also, the mean age of the respondents is higher than the US mean and there are more women respondents than men respondents in both the group average and the immigrant group.

TABLE 1

Descriptive Statistics, Understanding America Study, All Respondents and Immigrants, Global Findex Database

	Variables	All Respondents (N=6,882)	Immigrants (N=541)
Dependent variables	Financial Literacy Score, Mean	8.91	8.65
	Std. Deviation	2.67	2.68

	Variables	All Respondents (N=6,882)	Immigrants (N=541)
Financial Access and Inclusion	Global Findex Database, Mean	0.9167	0.6215
	Std. Deviation	0.1133	0.2725
Control variables	Age of a respondent, Mean	47.92	45.36
	Std. Deviation	15.58	14.35
	Gender		
	Male	43%	41%
	Female	57%	59%
	Education		
	Less than high school	1.21%	5.36%
	High school diploma	1%	2.77%
	Some college	2.32%	2.03%
	Associate degree	21.39%	17.56%
	Bachelor's degree	23.89%	16.64%
	Post-bachelor's degree	50.19%	55.64%
	Natural Log Average Income, Mean	10.7056	10.6987
	Std. Deviation	1.026	1.048
	Immigrant Status (% respondents)	7.86%	100%

Multivariate Results

TABLE 2

Regression Coefficients for All Respondent Models, Global Findex Database

Variables	Model 1		Model 2		Model 3	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Financial Literacy Scores						
Age of respondent	0.029***	0.002	0.028***	0.002	0.028***	0.002
Female	-0.905***	0.056	-0.906***	0.056	-0.906***	0.056
Education (ref: less than high school)						
High school diploma	-0.418	0.314	-0.408	0.314	-0.412	0.314
Some college	0.161	0.253	0.136	0.253	0.131	0.254
Associate degree	0.552**	0.210	0.522*	0.210	0.518*	0.210
Bachelor's degree	1.368***	0.216	1.333***	0.216	1.329***	0.216
Post-bachelor's degree	2.314***	0.212	2.281***	0.213	2.278***	0.213
Ln Average Income	0.749***	0.030	0.746***	0.030	0.747***	0.030
Immigrant	-0.266**	0.096	-	-	-0.042	0.142
Inclusion Factor	-	-	0.791***	0.227	0.718*	0.337
Constant	-1.586***	0.371	-2.246***	0.397	-2.176	0.463

Variables	Model 1		Model 2		Model 3	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
R-squared	0.337		0.338		0.338	
Wald-test for financial literacy variable(s)	353.468	p-value <.000	354.215	p-value <.000	318.756	p-value <.000

Note: Weighted results. Significance level: $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Model #1: Immigrants

The combination of education category, natural log of average income, age, and immigrant status accounts for 33.7% of the differences in financial literacy test scores and is statistically significant. According to the model, age, income, and an education of some college and above, are positively correlated at with increased financial literacy exam scores.

Age – 0.029
Income – 0.749
Some college – 0.161
Associate degree – 0.552
Bachelor's degree – 1.268
Post-bachelor's degree – 2.314

Being a female and having only finished high school are negatively correlated at -0.905 and -0.418 respectively with financial literacy exam scores. Immigrant status is also negatively correlated at -0.266 with a lower score on financial literacy exam. Age, female, bachelor's degree, post-bachelor's degree, and natural log of average income are all very significant when predicting financial literacy scores. Immigrant is significant, but not as much as other factors.

Immigrant status on its own, without accounting at all for any differences in country of origin, has a statistically significant impact on US financial literacy test scores with a p-value of less than 0.01.

Model #2: Inclusion

In this model, the immigrant status is replaced with the birth country Global Findex Database Inclusion metric. This ideally gives a more in depth look at whether country of origin financial inclusion has a significant level of impact on financial literacy scores, or if immigrant status has a greater impact. When this metric is used instead of immigrant status, many of the same variables continue to be positively correlated with financial literacy test scores (age, ln average income, and education level over some college).

Age – 0.028
Income – 0.746
Some college – 0.136
Associate degree – 0.522
Bachelor's degree - 1.333
Post-bachelor's degree – 2.281

Female and having only finished high school again are negatively correlated with financial literacy at -0.906 and -0.408 respectively. The Global Findex Database Inclusion metric is positively correlated (0.791) with financial literacy scores and very statistically significant with a p-value under 0.001.

Model #3: Immigrant and Inclusion

When combining both immigrant status and the Global Findex Database Inclusion metric, immigrant status continues to be negatively correlated with financial literacy scores at-0.042 while the Global Findex Database Inclusion metric continues to be positively correlated at 0.718 with financial literacy scores. In this Model, immigrant status lost its statistical significance while the inclusion factor decreased its statistical significance to only have a p-value of less than 0.05. While the inclusion factor continues to be statistically significant, its value as a predictor has decreased when immigrant status is also included. Age, female, and education including and over a bachelor's degree continue to be very statistically significant with p-values of less than 0.001.

Model #4: Just Immigrants and Inclusion

TABLE 3

Regression Coefficients for Immigrant Respondents Only, Global Findex Database

Variables	Model 1d	
	Coefficient	Standard error
Financial Literacy Scores		
Age of respondent	0.019*	0.007
Female	-0.871***	0.204
Education		
High school diploma	0.060	0.628
Some college	1.672*	0.733
Associate degree	0.196	0.401
Bachelor's degree	0.657	0.463
Post-bachelor's degree	2.054***	0.400
Ln Average Income	0.832***	0.108
Immigrant	-	-
Inclusion Factor	1.140**	0.414
Constant	-2.791*	1.144
R-squared	0.394	
Wald-test for financial literacy variable(s)	31.615	p-value <.000

Note: Weighted results. Significance level: $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

This Model specifically examines the 541 respondents who identified as immigrants in the UAS who also identified their age and gender, answered all questions in the survey, and were from a country listed in the 2017 Global Findex Database. Here, the Global Findex Index metric is statistically significant with a p-value of less than 0.01 and positively correlated at 1.140 with financial literacy scores. Income, education post-bachelor's degree, and female are all very statistically significant with p-values of less than 0.001 among just immigrants. Having finished some college, having education post-bachelor's degree, and coming from a country with a higher level of financial inclusion have the largest positive correlation with financial literacy scores and are among the greatest statistically significant predictors.

Some college 1.672 (p-value less than 0.05)
Post-bachelor's degree 2.054 (p-value less than 0.001)
Inclusion Factor 1.140 (p-value less than 0.01)

Most significant from this Model, is the fact that in just the immigrant population, the inclusion factor was both statistically significant and positively correlated to financial literacy scores, showing that this variable does have predictive value.

DISCUSSION AND IMPLICATIONS

This research could be used as a basis for further research around factors influencing immigrant and refugee success in US financial markets and institutions upon re-settlement in the United States. While there is definitive evidence in past research, both in the US and abroad, that immigrants and refugees face specific challenges to being financially literate and successful in their new countries, there still needs to be work done to determine which specific factors could be isolated as to the cause of these challenges. To say that one is an immigrant and therefore they must have less success in US financial systems is too broad a statement to make about all immigrants, despite the statistically significant relationship between self-identifying as an immigrant and a decrease in financial literacy scores.

As mentioned in the Methods section, the Understanding America Study does not include information about age at immigration. This information is needed to further understand how levels of financial access and inclusion in home country could change based upon the age of an individual at immigration. Our inability to definitely control for immigration age and date to the United States, as well as the small sample size, make the Understanding America Study a sub-par initial study to work from and influenced our lack of statistically significant relationships between our proxy index and financial literacy scores.

Despite the limitations of the Understanding America Study, there were still statistically significant results found showing that country of origin level of financial inclusion does impact results on US financial literacy exams and therefore likely impact functional financial literacy. Immigrant status is statistically significant when not examining any other country specific factors. The Global Findex

Database is even more statistically significant when used by itself. When both immigrant status and the Global Findex Database are used as independent variables, immigrant status loses its significance and the Global Findex Database becomes less significant, even though it does continue to be statistically significant. When examining just immigrants, the Global Findex Database is a statistically significant predictor of immigrant financial literacy scores.

The Global Findex Database's measure of the percent of a population with a formal financial account is a good proxy for previous financial inclusion and shows that home country level of inclusion does influence knowledge about US financial systems and financial literacy. When looking at the whole population with both immigrant status and the inclusion proxy, the inclusion proxy is a better predictor of financial literacy than immigrant status. This helps highlight the fact that not all immigrants are the same and that factors other than immigrant status should be considered when planning financial literacy educational programming. When looking at just the immigrant population, the inclusion proxy was still a strong, statistically significant indicator of financial literacy test scores. With the inclusion indicator being statistically significant in all models, it seems safe to conclude that country of origin inclusion should be considered an important factor when educating new arrivals to the United States.

This research advocates for innovations in financial literacy education programming based on an acknowledgement of the differences immigrants bring from previous financial access and inclusion. While this research looks at the overall percentage of the population that has access to financial institutions, further research to understand which sub-sects of the populations have access to institutional finances should be considered. For example, while some countries might have 50% access to financial accounts, this percentage might be entirely men based on cultural banking norms. These factors are not considered in this research and would give a much deeper understanding of how previous access to finances influences success in the United States.

Also, further research should utilize different databases or different ways to combat the age limitation in the Understanding America Study. Crude age could be considered by multiplying age by the percent of

the population with financial accounts (Global Findex Database inclusion proxy), but this is not as accurate as having people report their date of, and at age, immigration.

This research suggests that further efforts need to be made when teaching financial literacy classes and creating policy specifically for the immigrant population. A deeper understanding of what immigrant population you are working with needs to be reached and considered. Different experiences with financial institutions, access to, and inclusion in these institutions and different perspectives on finance need to be addressed. Differing levels of financial inclusion in home countries have led to differing levels of financial understanding in the United States. This needs to be considered by nonprofits, governmental organizations, policymakers and banks and businesses when working with the immigrant population especially since most immigrants come from countries with lower levels of financial inclusion than in the United States.

REFERENCES

Abdulmumin, Biliqees Ayoola. 2018. *Determinants of Financial Inclusion in Sub-Saharan Africa*. (Doctoral dissertation, Kwara State University)

Acemoglu, D., S. Johnson and J.A. Robinson. 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review, 91(5)*: 1369-1401

Agyekum, Francis Kwame. 2017. *A Trajectory of Financial Inclusion Towards Economic Inclusion. Empirical Evidence from LICs-Ghana as a Case.* (Doctoral dissertation, The University of Waikato)

Amidzic, Goran, Alexander Massara, and Andre Mialou. 2014. Assessing Countries' Financial Inclusion Standing – A New Composite Index. *IMF Working Paper, Statistics Department IMF.*

Aron, J. 2000. Growth and Institutions: A Review of the Evidence. *The World Rank Research Observer, 15(1)*: 99-135

Arora, Rashmi Umesh. 2012. Financial Inclusion and Human Capital in Developing Asia: the Australian Connection. *Third World Quarterly, Vol. 33, No. 1:* 179-199

Beach, William W. and Marc A. Miles. 2006. Explaining the Factors of the Index of Economic Freedom. *2006 Index of Economic Freedom*: 55-76

Bjornskov, Christina, Axel Dreher, and Justina A. Fischer. 2010. Formal Institutions and Subjective Well-Being: Revisiting the Cross-Country Evidence. *European Journal of Political Economy 26(4)*: 419-430

Cardona-Ruiz, Daniel Elifonso, Maria Camila Hoyos-Alzate, and Fabiola Saavedra-Cabellero. 2018. Genero e inclusion financiera en Colombia/Gender and Financial Inclusion in Colombia. *Ecos de Economia Vol. 22(46),* (June): 60-90

Correal,, D. 2016. Immigrants Facing Unique Financial Challenges. *Consumer Financial Protection Bureau* (July) https://www.consumerfinance.gov/about-us/blog/immigrants-facing-unique-financial-challenges/

Council, N. F. (2019). What is Financial Literacy. *National Financial Educators Council* https://www.financialeducatorscouncil.org/financial-literacy-definition/

Demirguc-Kurt, Asil, and Leora Klapper. 2012. Financial Inclusion in Africa: An Overview (English). *Policy Research Working Paper, The World Bank.*

Demirguc-Kurt, Asli, and Leora Klapper. 2012. Measuring Financial Inclusion: The Global Findex Database. *World Bank Policy Research Working Paper WPS6025*, (April)

Demirgüç-Kunt, Asli, Leora Klapper, Dorothe Singer, Saniya Ansar, and Jake Hess. 2018. The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. *World Bank*

Fraser Institute. Economic Freedom of the World: 2019 Annual Report. 2019 https://www.fraserinstitute.org/economic-freedom/dataset?geozone=world&year=2017&page=dataset&min-year=2&max-year=0&filter=0

Financial Literacy and Education Commission. (2019). *US Department of the Treasury* https://home.treasury.gov/policy-issues/consumer-policy/financial-literacy-and-education-commission

Gibson, John D. M. (2014). The Impact of Financial Literacy Training for Migrants, Volume 28, Issue 1. *The World Bank Economic Review*, 130-161.

Hall, Joshua C., and Robert A. Lawson. 2014. Economic Freedom of the World: An Accounting of the Literature. *Contemporary Economic Policy, Vol. 32, No.1,* (January): 1-19

Hastings, J. a. (2020). How financial literacy and impatience shape retirement wealth and investment behaviors. *Journal of Pension Economics & Finance*: 1-20.

Huston, S. J. (2010). Measuring Financial Literacy. *The Journal of Consumer Affairs,* 44 (2): 296-316.

Keshner, Andrew. 2019. "Financial Literacy Skills Have Taken a Nose Dive since the Great Recession."
MarketWatch. June 27, 2019. https://www.marketwatch.com/story/americans-financial-literacy-skills-have-plummeted-since-the-great-recession-2019-06-26.

Knedlik, Tobias, and Franz Kronthaler. 2007. Aid and Economic Freedom: An Empirical Investigation
Using the Heritage Index. *Journal of Development Perspectives Vol. 3(1),* (February): 116-136

Laith Alattar, M. M. (2018, May). An Introduction to the Understanding America Study Internet Panel.
Social Security Bulletin 78: p. 2.

Kim, Minjun S. C. (2017). Economic System and Financial Literacy: Evidence from North Korean
Refugees. *Emerging Markets Finance and Trade, Volume 53, Issue 11*: 2505-2527.

Malcom, Hadley. 2013. Financial Literacy Education Has Real-Life Impact. *USA Today* (November 13)
https://www.usatoday.com/story/money/personalfinance/2013/11/13/financial-literacy-education-requirements/2953667/.

Mitchell, A. L. (2014). The Economic Importance of Financial Literacy. *Journal of Economic Literature, 52(1):*5-44.

Morton, H. (2018, 12 20). Financial Literacy 2018 Legislation. *National Conference of State Legislatures*
http://www.ncsl.org/research/financial-services-and-commerce/financial-literacy-2018-legislation.aspx

North, D.C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge
University Press.

ODEC. 2006. The Importance of Financial Education. *Policy Brief: Organization for Economic Co-Operation and Development,* (July)

Omojolaibi, Joseph A. 2017. Financial Inclusion, Governance and Economic Progress in Nigeria: What Happens to the Welfare of the Poor? *Arabian Journal of Business and Management Review (Oman Chapter) Vol. 6, No. 7*, (February): 72-85

Persson, T. 2004. Consequences of Constitutions. *Journal of the European Economic Association, 2(2-3)*: 139-152

Rhine, Sherrie. (2006). The Determinants of Being Unbanked for US Immigrants. *Journal of Consumer Affairs, Volume 40, Number 1*: 21-40

Rutherford, M. 1995. The Old and the New Institutionalism: Can Bridges Be Build?. *Journal of Economic Issues, 29(2)*: 443-451

Spruk, Rok, and Aleskandar Keseljevic. 2016. Institutional Origins in Subjective Well-Bring: Estimating the Effects of Economic Freedom on Happiness. *Journal of Happiness Studies Vol. 17, Issue 2* (April): 659-712

The Heritage Foundation. (2019). 2019 Index of Economic Freedom.

University of Southern California Dornsife Center for Economic and Social Research. (2018). Understanding America Study: UAS 1: Financial Literacy; Personality; Understanding Probabilities; Numeracy. *University of Southern California Los Angeles, California, United State of America.*

Zuhair, Segu G. W. (2015). Migrants and self-reported financial literacy. *International Journal of Social Economics, Vol. 42 No. 4:* 368-386.

Zulkhibri, Muhamed, and Reza Chazal. 2017. The Impacts of Governance and Institution on Financial Inclusion: Evidence from Muslim Countries and Developing Economies. *JKAU: Islamic Economics, Vol 30, Special Issue*, (April): 37-60

.

APPENDIX

Multicollinearity Check for All Respondents and Variables

Variables	Collinearity Statistics	
	Tolerance	**VIF**
Financial Literary Test Score		
Age of respondent	0.979	1.021
Female	0.970	1.031
High school diploma	0.601	1.663
Some college	0.367	2.728
Associate degree	0.078	12.728
Bachelor's degree	0.112	8.936
Post-bachelor's degree	0.070	14.347
Ln Average Income	0.776	1.289
Immigrant	0.437	2.289
Global Findex Database	0.430	2.323
Constant	-	-

Dependent Variable: Financial Literacy Test Score
Weighted Least Squares Regression – Weighted by Weight

Table of Distribution for Correct Financial Literacy Scores

	All Respondents	**Immigrants Only**
Min	0	1
25th Percentile	7	7
50th Percentile	9	9
75th Percentile	11	11
Max	14	13

Descriptive Statistics, Understanding America Study, All Respondents and Immigrants, Financial Freedom Index

	Variables	All Respondents (N=6,890)	Immigrants (N=549)
Dependent variables	Financial Literacy Score	8.74	8.64
Financial Access and Inclusion	Financial Freedom Index, mean (median)	77.46 (80.0)	55.07 (60.0)
Control variables	Age of a respondent, mean (median)	47.49 (46.0)	45.41 (43.0)
	Gender		
	Male	48%	41.17%
	Female	52%	58.83%
	Education		
	Less than high school	2%	5.46%

Variables	All Respondents (N=6,890)	Immigrants (N=549)
High school diploma	1%	2.73%
Some college	3%	2.19%
Associate degree	34%	17.67%
Bachelor's degree	18%	16.39%
Post-bachelor's degree	42%	55.56%
Ln Average Income mean (median)	10.7622 (10.9151)	10.6857 (10.9151)
Immigrant Status	10	100

Regression Coefficients for All Respondent Models, Financial Freedom Index

Variables	Model 1a		Model 1b		Model 1c	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Financial Literacy Scores						
Age of respondent	0.031***	0.002	0.031***	0.002	0.031***	0.002
Female	-0.969***	0.057	-0.965***	0.057	-0.970***	0.057
Education (ref: less than high school)						
High school diploma	-0.584*	0.274	-0.548*	0.274	-0.602*	0.274
Some college	0.339	0.220	0.410	0.219	0.347	0.220
Associate degree	0.504**	0.504	0.574***	0.180	0.508**	0.181
Bachelor's degree	1.404***	0.195	1.476***	0.194	1.414***	0.195
Post-bachelor's degree	2.275***	0.188	2.338***	0.187	2.276***	0.181
Ln Average Income	0.740***	0.030	0.741***	0.030	0.742***	0.030
Immigrant	-0.239**	0.092	-	-	-0.440**	0.144
Financial Freedom Index	-	-	0.002	0.003	-0.008	0.004
Constant	-1.618***	0.353	-1.906***	0.390	-1.007	0.488
R-squared	0.339		0.338		0.339	
Wald-test for financial literacy variable(s)	353.186	p-value <.000	352.142	p-value <.000	318.285	p-value <.000

Note: Weighted results. Significance level: $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Regression Coefficients for Immigrant Respondents Only, Financial Freedom Index

Variables	Model 1d	
	Coefficient	Standard error
Age of respondent	0.026***	0.007
Female	-0.825***	0.203
High school diploma	-0.181	0.634

Variables	Model 1d	
	Coefficient	Standard error
Some college	1.598*	0.740
Associate degree	0.249	0.394
Bachelor's degree	0.745	0.457
Post-bachelor's degree	2.078***	0.396
Ln Average Income	0.839***	0.106
Immigrant	-	-
Financial Freedom Index	-0.001	0.005
Constant	-2.445*	1.137
R-squared	0.370	
Wald-test for financial literacy variable(s)	28.869	p-value <.000

Note: Weighted results. Significance level: $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Description of Key Variables in the Understanding America Study

Uasid	Identifying code for each respondent. Stays with the respondent through time and is used to merge datasets.
Female	Indicates female respondents if =1. Else 0=male
Immigrant	Indicates respondents not born in the US if =1. Else born in US =0
Inclusion	The Global Findex Database percentage of population with financial account over the age of 15 years old.
Ln_AverageIncome	Indicates natural log of income category midpoints to account for a 1% change in income versus a $1 change
Countryborn	Indicates country of birth
Age	Indicates age of respondent
Financial_Freedom	Indicates Financial Freedom score for country of birth
LTHS	Indicates Less than High School Education
HS	Indicates High School Education
Somecol	Indicates Some College
AA	Indicates associate degree
BS	Indicates bachelor's degree

postBS	Indicates education past bachelor's degree
SumofCorrect*	Indicates number of correct answers on the financial literacy questions
Weight*	Indicates individual weight of respondent

Financial Freedom Index

The Financial Freedom index was originally used as the dummy variable for each country of origin since there is no practical way of testing or measuring each individual country of origin with the sample size in the Understanding America Study. The index was originally used as a proxy for financial access and inclusion to test the general hypothesis.

The financial freedom variable is taken directly from the 2019 Index of Economic Freedom. The Index of Economic Freedom is an annual guide published by the Heritage Foundation, a Washington-based think tank. In this Index, the Heritage Foundation strives to track, monitor and understand how economic freedoms influence and improve lives. According to the Heritage Foundation, the Index is "… poised to help readers track over two decades of the advancement in economic freedom, prosperity, and opportunity and promote these ideas in their homes, schools, and communities." (The Heritage Foundation, 2019)

The definition of economic freedom is the:

> …fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please. In economically free societies, governments allow labor, capital, and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself. (The Heritage Foundation, 2019)

The Index measures economic freedom using 12 different metrics split across 4 different Freedom Categories: Rule of Law, Limited Government, Regulatory Efficiency and Open Markets. Within the Open Markets category, Trade Freedom, Investment Freedom and Financial Freedom metrics measure the openness and freedom of financial markets in the 186 countries measured.

The Financial Freedom metric measures the independence of the financial sector from the government and banking efficiency. Ideally, when banking and finance have a minimum of government interference, independent central banking and regulation of financial institutions allow for individual financial freedom

and growth. When credit is allocated on market terms and financial institutions are free to provide various financial services to both businesses and individuals based on market conditions, individuals have access to and knowledge of the services necessary to build their own wealth.

The Index measures an economy's financial freedom by examining:

1. Government regulation on financial institutions
2. State ownership of banks and financial institutions through direct and indirect ownership
3. Financial and capital market development
4. Government influence on credit
5. Openness to foreign competition

For the sake of this research, the Financial Freedom metric in the 2019 Index of Economic Freedom serves to level of individual access and inclusion in home country financial services – including banks, credit markets and institutions. A high score indicates the lack of government ownership of assets and institutions, that the market dictates credit and access to institutions, and that individuals have options and are included in financial markets.