Reading into Literacy Rates: A Comparative Analysis of Economic Literacy and Prosperity

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Abstract

Financial and economic literacy are essential for making sound investment, educational, financial, and political decisions, and yet some of the most developed nations in the world do not require all voting citizens to take courses in personal finance and basic economic theory. There is a strong case for economic and financial literacy influencing the overall prosperity of nations. When the general population better understands how economic systems work and how to properly steward their own resources, nations naturally become more prosperous. The empirical evidence presented in this paper shows a strong correlation between rising GDP and other quality of life indicators and the economic and financial literacy rates of the general population. In addition to increased economic and individual prosperity there are strong indications that education about financial and economic issues lead to more stable and transparent government systems.

Keywords: Economic literacy, Human Development Index, Geni Index, Economic Prosperity, quality of life, Financial Literacy.

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Introduction

The world is rich in its variety of nations, each with their own flavor and story. Each nation is a unique combination of history, culture, politics, and people. There is much debate over the perfect recipe for a prosperous nation. Some believe that freedom and democracy are key ingredients; others believe a strong central government is fundamental for developing a distinguished and influential nation. Many of the world's strongest and greatest nations have taken vastly different paths to become what they are today. For some nation states, a distinctive cultural history shapes the recipe for success. Other nations find that ending corruption and ensuring transparency are key ingredients. A country must find the right mix of freedom, government oversight, cultural values, and political structures to create a successful and prosperous nation for its people.

In the same way that distinctive flavors can be recognized across a wide variety of delicious dishes, there are a number of indicators that are present across the world's most successful nations. Economic prosperity is often used to judge the success of a nation, but what are the key ingredients in creating economic prosperity, and are these ingredients the same in many different nation states? This comparative study looks at a wide variety of nations, both developed and developing, to examine factors that promote economic prosperity.

The prosperity of a nation can be measured in a number of different ways. Traditionally the successfulness of a nation is measured in terms of its economic prosperity, often indicated by the given level of gross national income (GNI) or gross domestic product (GDP) (Amadeo, 2017). This can in some cases be misleading, as it does not account for other factors such as population or wealth distribution. Comparing GDP per capita, inflation rates, purchasing power, or unemployment are alternative ways to compare the economic prosperity of nations (Simpson,

2017). But economic prosperity should not be the only indicator for the success of an entire nation. It is also important to look at data that reflects the quality of life of the people living within the nation. The Human Development Index is one measure that takes into account other factors that affect the quality of life of the general population. This index is a composite measurement that takes into account life expectancy, schooling, and per capita income indicators (Human Development Index: Human Development Reports, 2017). Similar to the Human Development Index the Legatum Prosperity Index also measures factors that affect individuals in addition to more traditional economic indicators. The Legantum Prosperity Index takes into account wealth, economic growth, education, health, personal well-being, and quality of life. This allows for a fuller interpretation of the overall success of a nation state (The Prosperity Index, 2017).

When comparing countries, it is also important to look at income distribution and corruption. A country could appear to have a higher GDP but have a very wide income distribution wherein the average citizen does not experience the economic prosperity or growth of her or his nation. The Geni Coefficient is an effective tool for looking at income distribution in order to gain a fuller understanding of the prosperity of everyday citizens (Geni Index, 2017). It can also be beneficial to look at government corruption and transparency rates as gains in economic prosperity cannot be passed to the general population if there are high levels of corruption within the government.

All of these resources are excellent for measuring and gauging the success of a nation and also allow for a closer look into the flourishing of individuals in each nation-state. But these factors do not explain why one country is more prosperous than another or what factors most influenced the thriving economy of a given nation. To gain insights into root causes of national

success, one must examine what factors are present across a variety of prosperous nations. Finding correlations between factors and the overall prosperity of nations can clarify what ingredients are necessary for a flourishing state. Culture, politics, and specifically education no doubt play important roles in the prosperity of a nation. In fact, to understand what causes economic success, it is important to look at just how much the average citizen in a nation understands about the economy, as well as financial issues.

Economic literacy is defined as the ability to understand, identify, and evaluate economic concepts in relation to personal finance, the economy, and political systems; it is important for the overall success of a nation for a variety of reasons (Johnson, 2013). Personal finance is a large part of economic literacy, and can be used as a proxy for measuring financial literacy. Financial literacy can be identified as a subset of economic literacy and is defined as the ability to understand the use and stewardship of money in society in relation to earning, managing, investing, and donating (Johnson, 2013). Personal finance may seem like a deeply private matter, but it affects all of society and influences the success of entire economies. Simply put, even the largest economies are made up of individuals spending, investing, and saving their money. When individuals are more informed about how to wisely manage their money, they are more likely to participate in activities that further the economy such as saving, investing, and home buying (Greenspan, 2002). For this reason financial literacy can in some cases be used as a proxy for economic literacy.

Understanding other aspects of economic literacy also can positively impact a nation's economy. Economic literacy includes an understanding of the overall economy and economic concepts in relation to politics. The general population's understanding of economic and financial concepts and their effects on political policy can have a significant impact on the

overall success of nations. This is particularly true for representative democracies, where the electorate is using their general knowledge to make informed political decisions. It is the responsibility of the electorate in these cases to equip themselves with the knowledge they need to elect representatives who will make the best decisions for the economy. Economic literacy is one of the core competences necessary for voters to make informed decisions (Nourse, 1964).

In politics, personal finance, or economic participation, economic literacy certainly has some impact on the overall economic success of a nation and in turn the prospering of nations. This study looks to gauge the presence of economic and financial literacy in developed and developing nations in order to ascertain the potential for correlations between economic literacy and prosperity in a sample of countries.

Literature review

The head of the central banking system in the United States of America is responsible for and contributes to the overall well being of the economy. Alan Greenspan (2002) was the chairman of the Federal Reserve from 1987 until 2006, and while in office, he wrote a piece for the *Futurist* titled "Financial Literacy: a Tool for Economic Progress," wherein, he discussed the importance of financial literacy and its impact on the overall economy. He explained that when individual households flourish, the overall economy is improved. He explained that for the average household there are three basic principles for asset accumulation: homeownership, small business ownership, and savings. In this article he goes on to explain the effect of each of these principles. When looking at homeownership, he posits that when homeownership is flourishing there is an increase in neighborhood stability, more civic-minded residents, better school systems, and reduced crime rates. Homeownership can also be an important investment tool for individuals as well as offering more stability than other forms of investment (Greenspan, 2002).

In looking at the importance of small business investment Greenspan (2002) sees increasing small business ownership as a way to empower minorities and impoverished citizens. While it is empowering to citizens, allowing them to invest and accumulate capital, small business ownership also promotes a healthy economy as it makes up around half of all private gross domestic product (Greenspan 2002).

Finally, Greenspan (2002) talks about the personal financial matter of saving. Individuals most commonly save to promote their own liquidity, offer educational opportunities, or provide a stable retirement. In the words of Alan Greenspan "Household savings is a fundamental component for increasing financial capacity and serves as a starting point for the accumulation of future tangible assets, such as homes and businesses" (which we have already established as tools for economic progress for both the individual and the nation state) (p. 38). Greenspan then goes on to explain the role of both communities and educators in fostering economic literacy in order to promote these principles that help individuals and economies flourish. Greenspan explains that teaching financial literacy in an educational setting especially helps lower income families to understand and take part in value adding activities that will allow them to rise.

The impact of economic and financial literacy on the flourishing of the individual is especially prevalent in rapidly developing nations like South Africa. In his article "Economic Literacy and the War on Poverty: a Social Work Challenge" Lambert Engelbrecht (2008) examines poverty in South Africa from a social work perspective and suggests that economic literacy is an effective tool in alleviating the great poverty and wealth disparity. Engelbrecht notes that the Geni coefficient (to be discussed further in this paper), which measures income inequality on a scale of zero (perfect equality) to one (perfect inequality), reports the coefficient for South Africa is 0.73. For the social work field, this is a call for action. Engelbrecht discusses

that there must be a combination of social assistance and developmental strategies that help reduce poverty by building skills and capabilities that promote social and economic inclusion. There is no better means for enabling and promoting the financial independence of individuals than economic literacy (Engelbrecht, 2008).

Engelbrecht (2008) further examines how teaching economic literacy can be used as a tool for social workers as it not only helps individuals with personal finance but also helps individuals make better choices with financial assets because of the multi-dimensional concept of economic literacy that includes consumer literacy, financial literacy, and overall economic understanding. Engelbrecht presents a study on the use of financial literacy by social workers to alleviate poverty. In this study, he explains that social workers can contribute to economic literacy by educating their clients to better control their income, communicating economic wisdom, assessing their client's level of economic literacy, and identifying strategies for presenting economic literacy to their clients. Engelbrecht makes a strong case for social workers' use of economic education to alleviate poverty and diminish wealth disparity in South Africa and around the world (Engelbrecht, 2008).

Deborah Lee and Paul Grimes (2000) in *The Atlantic Economics Journal* also discuss the impact of economic literacy of individuals on the overall economic prosperity of nations in their article "Economic Literacy and Economic Growth." Lee and Grimes lay out the traditional argument of economic education for the flourishing of the individual with regard to cost benefit analysis. They then argue that economically literate people make better decisions about schooling, employment, personal finance, and politics and that these more positive choices impact and benefit aggregate society. Lee and Grimes suggest that an economically literate society should possess a stronger overall economy because the informed choices about

schooling, employment, and personal finance result in greater productivity and economically literate individuals also are able to make more informed political choices. (Grimes and Lee, 2000)

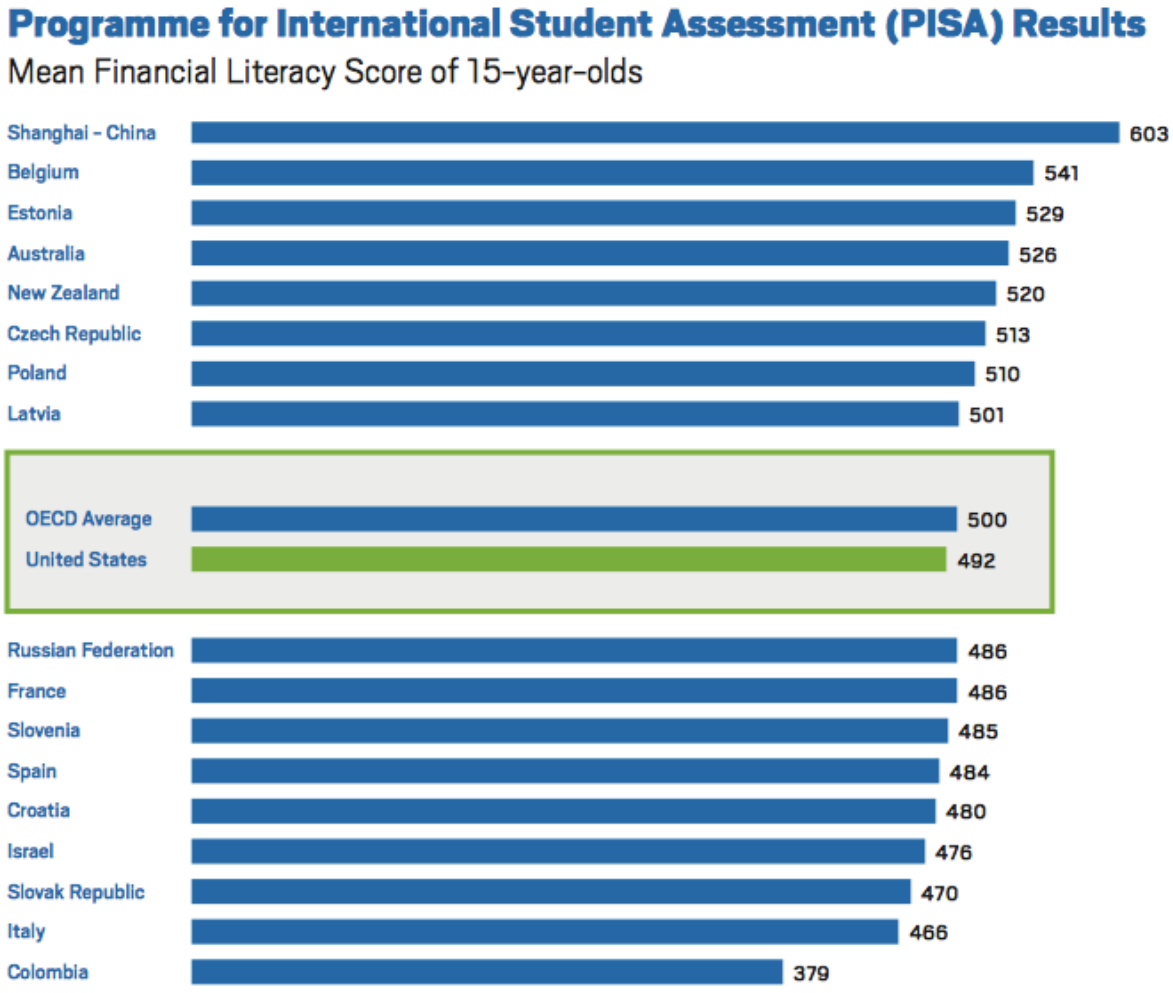
Grimes and Lee (2000) find a backing for this argument in data from state requirements of high school economics courses. Because different states began to require economics for high school education at different points in time, these researchers have identified an ideal case study to illustrate the impact financial literacy has on the aggregate economics of a state. In 1981 fifteen states required at least one semester of economics for graduation. When comparing the growth rate in gross state product (GSP) over the next fifteen years, states with required economic courses experienced a 3.34% increase in GSP while states without economic course requirements averaged a 2.64% increase. With a t-score of 2.03 this difference is statistically significant suggesting that this additional economic education is a relevant factor in promoting economic growth. (Grimes and Lee, 2000)

Economic literacy for the general population in order to benefit individuals and society at large has been an issue of importance for decades. Edwin Nourse (1964), Chairman of United States President Truman's Council of Economic Advisors discussed the importance of economic literacy for overall society in his article “What Would Economic Literacy Be Like?” For the bettering of society, Nourse suggests that economic literacy demands two things. One, competency in economics for the largest reasonable portion of the population for their administration of individual, family, and business affairs and two, economic competency for all voters for making informed political decisions. He then explains the positive effect that economic literacy can have on the choices of individuals in all business endeavors. He concludes by positing the necessity for voters to be literate in economic issues, questioning how can a

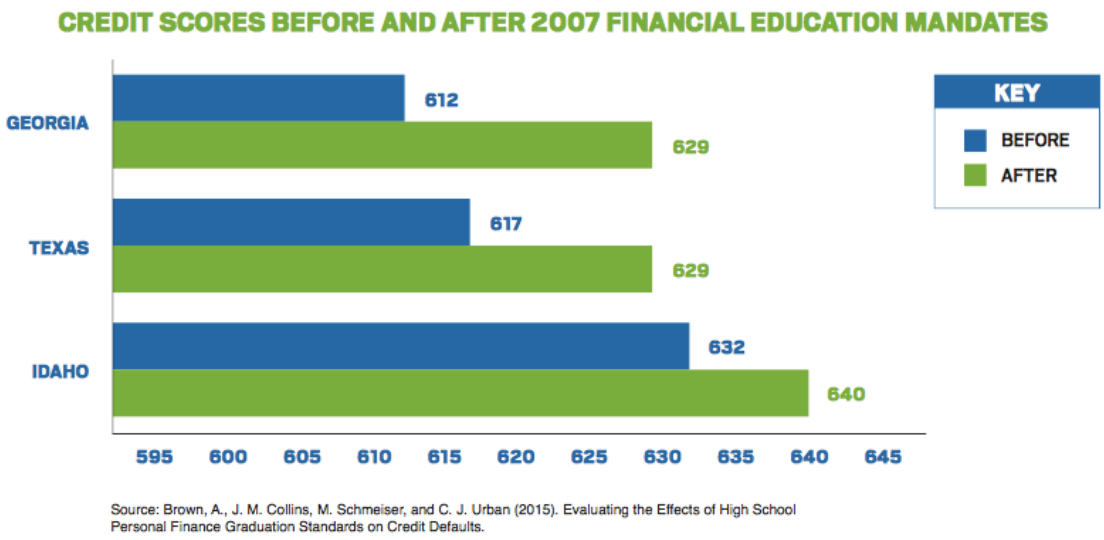
democracy be successful if the voters are unaware of how policy will influence the overall economy. It is therefore the responsibility of voters to remain economically literate in order to make informed political decisions (Nourse, 1964).

The acknowledgement of economic and financial literacy as a tool for empowering individuals has in modern times been recognized in the United States as well. In the wake of World War II and with the economic complexity of the era, The Counsel for Economic Education (CEE) was founded and collaborated with the United States president's Council of Economic Advisors to address the lack of economic education during this time of high job growth. The CEE and the Council of Economic Advisors concluded that American schools were not adequately equipped for providing students with the economic tools and skills to navigate the complex post war economy. At this time there were few resources for teachers that were undereducated in economic literacy and no national standards. The CEE began providing resources and economic and personal finance education to teachers during the forties and since then they have begun a number of campaigns and projects to promote and enable economic literacy throughout the country. The CEE publishes *The Journal for Economic Education* where they report on the level of economic literacy in the United States, the impact of literacy on the economy, and the progress of the CEE in continuing the promotion of economic and financial literacy. Every two years the CEE conducts an in depth look at economic and financial education for K-12 in every state. This report illustrates the progress the CEE is making in promoting economic financial literacy and the effectiveness of economic literacy in impacting the personal and public success of financial and economic decisions. The following charts are from the 2016 Survey of the States and illustrate the impact financial literacy has on individuals as well as the progress the United States has made in promoting economic literacy in comparison

to other countries. They convey the United States' standing in an assessment of financial literacy, as well as the impact of financial education mandates on the success of individuals indicated by their credit scores (*CEE: State of Financial and Economic Literacy in the US*, 2017).



Source: OECD (2014). *PISA 2012 Results: Students and Money: Financial Literacy Skills for the 21st Century (Volume VI)*. PISA, OECD Publishing.



Source: Brown, A., J. M. Collins, M. Schmeiser, and C. J. Urban (2015). Evaluating the Effects of High School Personal Finance Graduation Standards on Credit Defaults.

In their survey of the states, the Counsel for Economic Education refers to data from PISA, the Programme for International Student Assessment. This program evaluates the success of education systems around the world by testing the knowledge of fifteen-year-old students. Twenty-eight million fifteen-year-olds from 72 countries are tested by PISA with a two-hour exam covering science, mathematics, reading, collaborative problem solving, and financial literacy. They publish a specific report on the financial literacy of students in the surveyed countries. They also touch on the importance of financial literacy as graduating students around the world are entering into even more complex financial environments with a wider variety of complex products and financial tools at their disposal. PISA notes that governments around the world are recognizing the need for financial literacy and the impact that it can have on society and the economy. They are enacting legislation that pushes for the education of students in financial and economic matters. PISA posits that financial literacy is an essential skill for young people as it is crucial for making good financial decisions in regards to investment, education, savings, and retirement. With the advent of the digital era and the increase in globalization, the financial marketplace is becoming both more accessible and more complex. Students who wish to succeed in the fast-paced digital era must learn the basics of financial literacy in order to make

wise choices in regards to personal finance. See graph below to note the differences in countries in regard to student understanding of financial concepts (*PISA 2012 Results: Students and Money*, 2012).

	Performance in financial literacy				Relative performance in financial literacy, compared with students around the world with similar performance in mathematics and reading
	Mean score in PISA 2012	Share of lowest performers (Level 1 or below)	Share of top performers in financial literacy (Level 5 or above)	Gender difference (Boys - Girls)	
	Mean score	%	%	Score dif.	Score dif.
OECD average-13	500	15.3	9.7	1	2
Shanghai-China	603	1.6	42.6	-1	0
Flemish Community (Belgium)	541	8.7	19.7	11	9
Estonia	529	5.3	11.3	-3	5
Australia	526	10.4	15.9	-3	18
New Zealand	520	16.1	19.3	3	12
Czech Republic	513	10.1	9.9	6	19
Poland	510	9.8	7.2	3	2
Latvia	501	9.7	4.6	-11	1
United States	492	17.8	9.4	1	1
Russian Federation	486	16.7	4.3	1	14
France	486	19.4	8.1	-6	-24
Slovenia	485	17.6	5.8	-8	-8
Spain	484	16.5	3.8	6	4
Croatia	480	16.5	3.8	5	2
Israel	476	23.0	8.5	-6	-5
Slovak Republic	470	22.8	5.7	-3	2
Italy	466	21.7	2.1	**8**	-14
Colombia	379	56.5	0.7	0	-5

Note: Countries/economies in which the performance difference between boys and girls is statistically significant are marked in **bold.**
Countries and economies are ranked in descending order of the mean score in financial literacy in PISA 2012.
Source: OECD, PISA 2012 Database, Tables VI.2.1, VI.2.2, VI.2.3 and VI.3.1.
StatLink http://dx.doi.org/10.1787/888933094944

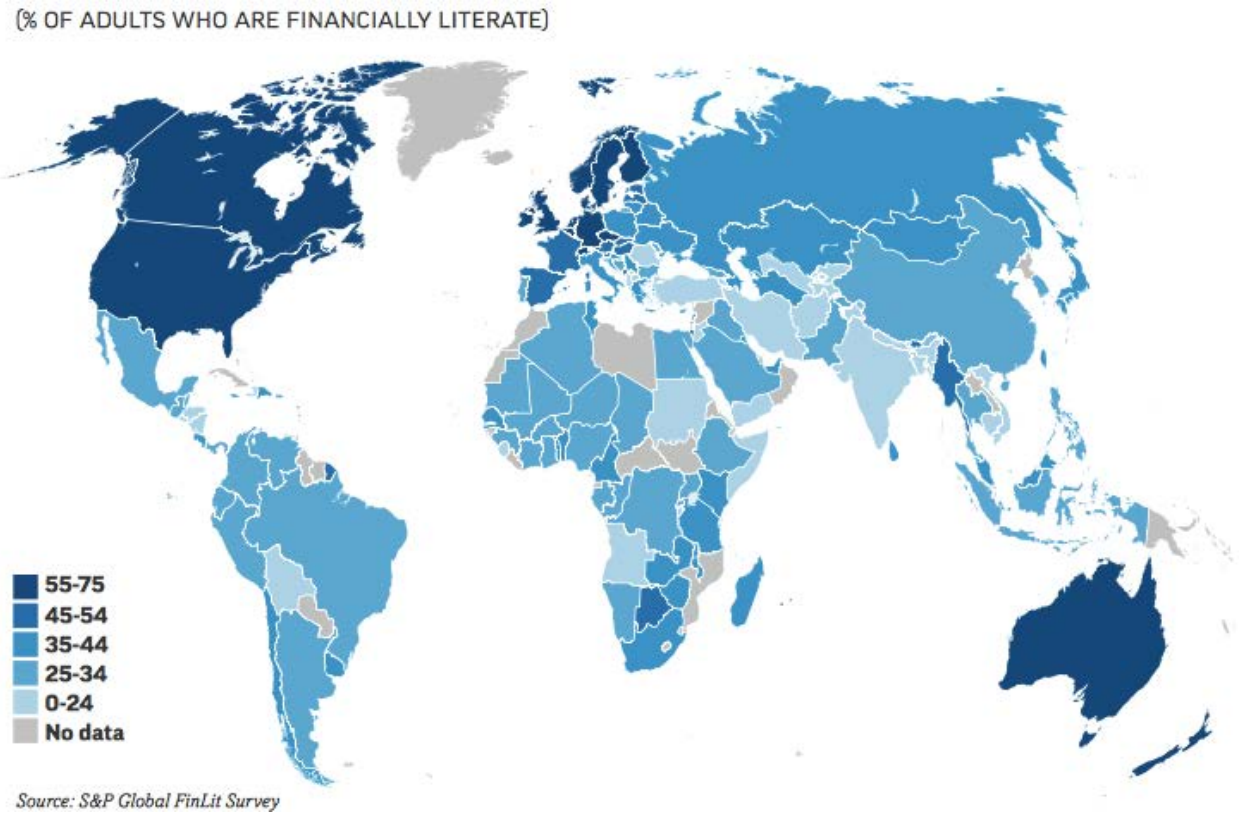
The Standing Committee for Economic and Commercial Cooperation of the Organization of the Islamic Cooperation (COMCEC) is one of four committees in the Organization of Islamic Cooperation. The organization's purpose is to increase economic well being in its member states in the areas of trade, transportation, agriculture, tourism, and poverty alleviation. This committee like many others sees the value in financial literacy. In COMCEC's (2013) article "Enhancing Financial Literacy in Capital Markets" the writers seek to argue for the importance of financial literacy for improving the economies of their member state. In this article, they explore surveys from PISA and other global organizations to illustrate the level of financial literacy worldwide.

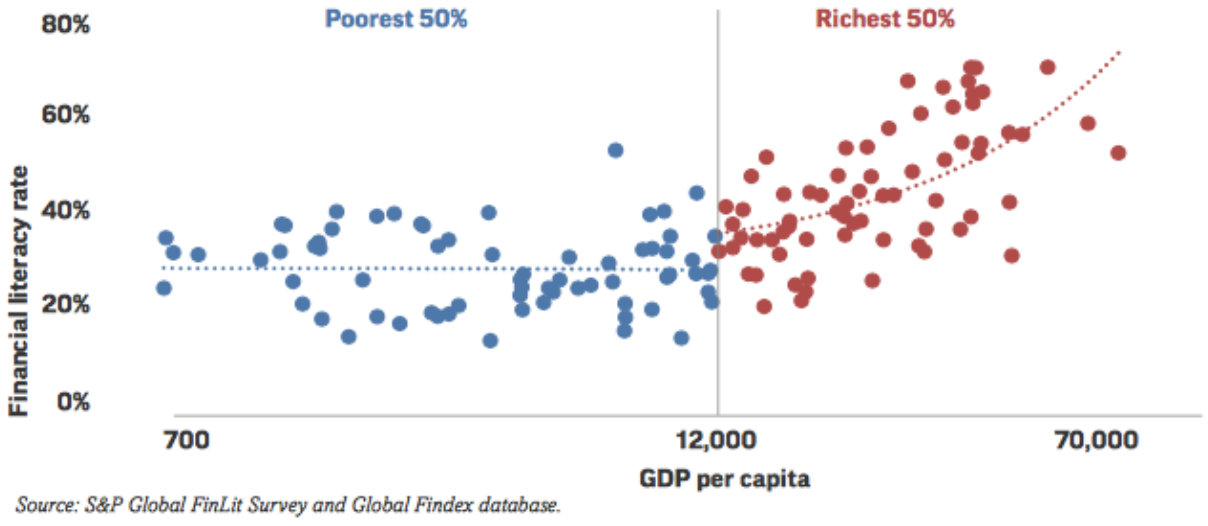
They define financial literacy as the ability to read, analyze, manage, and communicate the personal financial conditions that affect an individual's well being. The financially literate citizen is then able to make more informed decisions in regard to asset management and everyday financial decisions. They point out the growing complexity of financial markets because of more complicated investment vehicles that are challenging for average consumers to asses. Because of this growing complexity COMCEC suggests its member countries support financial literacy in order to prevent citizens from making poor decisions that adversely impact the individual and the overall economy (2013).

In light of the growing complexity of the global marketplace the Standard & Poor's Rating Services also sees financial literacy as a crucial component in creating sustainable financial markets around the world. It supported three authors, Leora Klapper and Peter Van Oudheusden from the World Bank and Annamaria Lusardi from the George Washington University School of Business, in publishing a report entitled "Financial Literacy Around the World: Insights from the Standard & Poor's Rating Services Global Financial Literacy Survey." Klapper, Vaan Oudheusden, and Lusardi (2016) present data from around the globe that illustrate the relative level of financial literacy and its affect on individuals and the economy. In this report the authors first present the case for financial literacy, stating that it enables individuals to make more informed decisions that improve their own financial well-being. For an illustration they present the case that consumers who do not adequately understand compounding tend to spend more on transaction fees, run up bigger debts, and incur higher interest rates all the while borrowing more and saving less. This adds up to the significant cost of financial illiteracy while citizens who have a better understanding of financial literacy are more likely to be successful in

financial planning, investing in diversified ventures, and saving for retirement (Klapper, Vaan Oudheusden, and Lusardi, 2016).

In order to test financial literacy across the globe the Standard & Poor's Rating Services Global Financial Literacy Survey tests for general knowledge about interest, inflation, compound interest, and risk diversification. This study looks at the percentage of adults who are financially literate, (see graphs below). After examining the percentage of financially literate citizens in a variety of developed and emerging economies, this study then compares financial literacy rates and GDP per capita. The graph illustrates an obvious trend between financial literacy and higher levels of GDP per capita. This study also looks at other factors including poverty, age, education, and gender in relation to financial literacy. As seen in the data below, there is an astounding lack of financial literacy particularly in developing nations. This survey is a call for action and concludes by articulating the importance of financial literacy in the changing financial markets especially when credit cards are on the rise, government pensions are being reduced and replaced with personal savings, and investment vehicles in the globalized digital marketplace are increasingly complex (Klapper, Vaan Oudheusden, and Lusardi, 2016).





Traditionally the prosperity of a nation is measured by success of its economy in terms of GDP, as in the graph above. Although this is a straightforward measure for comparing countries or determining economic growth, this measure does not take into account the actual prosperity of

the citizen. United Nations Development Program publishes the Human Development Index that takes into account the development of a nation in addition to its economic growth. The Human Development Index looks at a nation's achievement in three areas of development: long and healthy life, knowledge, and standard of living. Length of life is measured by life expectancy at birth, education is measured by the mean of years schooling for adults aged 24 and more expected years of schooling for children of school entering age, and standard of living is measured by gross national income per capita. This index does help to show a fuller picture of prosperity but does not take into account every aspect of human development. There are other factors including income inequality, government transparency, and empowerment that are more fully described in other indexes, but the Human Development Index is an excellent starting place for looking beyond only economic indicators for gauging the success of a nation (*Human Development Index: Human Development Reports*, 2017).

The Geni Coefficient is another excellent index for gaining a more complete picture of human development. This index looks at income distributions in 100 countries, ranking them on a scale of zero (perfect income distribution) to one (perfectly unequal income distribution). This coefficient can be used to supplement the Human Development Index because while the HDI looks at gross national income per capita it does not take into account wealth disparity. Using the Geni Coefficient in addition to other human development indicators helps convey the most conclusive and accurate picture of the prosperity, success and development of a nation (*Human Development Reports: The Geni Coefficient*, 2017).

Political stability and transparency can also play a major role in the development of a nation. There is a strong connection between corruption and wealth disparity that can create a vicious cycle wherein a country's wealth becomes more and more concentrated among a

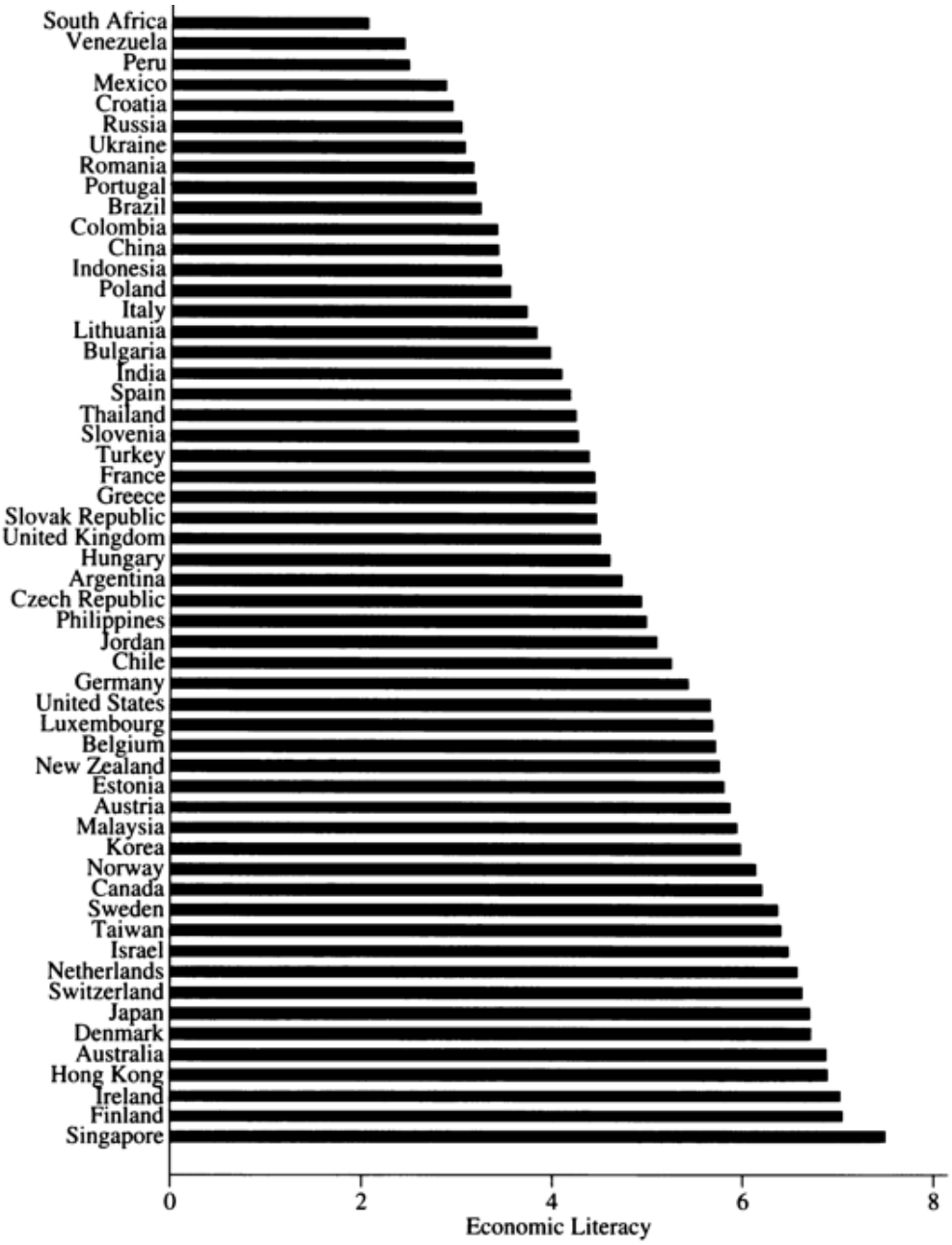
shrinking percentage of the population. Transparency International is a nonprofit organization that seeks to combat corruption and promote government transparency. This entity publishes a yearly Corruption Perception Index that is meant to capture how corrupt the public sector of each country is seen to be. This index ranks 176 countries, by scoring each country on a scale of one to one hundred. The level of transparency in a nation can point to differences in human development and the prospering of individuals within a nation (*Corruption Perceptions Index,* 2016).

The World Bank also provides useful data for gaining a fuller picture of human development. The Worldwide Governance Indicators Project is a part of the World Bank that reports on aggregate and individual governance. This study looks at over 200 countries and a variety of dimensions including voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. Looking at political stability and control of corruption can be beneficial when determining the human development in a nation (*Worldwide Governance Indicators*, 2017).

Tullio Jappelli (2010) in his article " Economic Literacy: An International Comparison" pulls together many of these concepts about the impact of economic and financial literacy when addressing the impact of economic literacy and correlations between economic literacy, math scores, economic development, urban population, and retirement contributions. He begins by stating the need for economic literacy and its increasing importance as households seek to navigate and invest in an environment where financial products are extremely complex and the number of available products has increased exponentially in recent years. Jappelli points to several studies that relate to financial literacy in relationship to both asset and debt management. Studies have found that lack of economic literacy can lead to poor risk diversification, inefficient

portfolio allocation, excessive debt, and increased debt transaction fees for individuals who do not know how to properly manage their debts and assets (Jappelli, 2010).

Jappelli (2010) also points to a study that illustrates the increased use of financial services in financially literate citizens who live in developing countries. Jappelli claims that well-informed financial consumers lead to better financial markets as knowledgeable consumers will not embrace "rogue products" and will be able to better navigate complex financial markets with a wide variety of global products. In his own studies of the correlations between economic literacy and math scores, economic development, urban population, and retirement contributions, Jappelli (2010) uses data from the World Competitiveness Yearbook to rank countries based on economic literacy. He also looks at this data in comparison to the Survey of Health, Assets, Retirement and Expectations to gauge economic literacy rates. After comparing economic literacy rates to a number of factors Jappelli concludes that the level of economic literacy is dependent on a variety of factors including educational achievement, social interactions (share of urban population), and mandated savings in the form of social security contributions (Jappelli, 2010). The graph below illustrates Jappelli's economic literacy ranking of 55 countries, used in his research.



Financial and economic literacy can have a tremendous impact on a number of different factors including capital markets, personal finance matters, poverty alleviation, and overall economic prosperity, as illustrated by the authors above. The literature reviewed in this paper covers a wide range of ways that economic and financial literacy can influence a nation's overall prosperity. Engelbrecht (2008) approaches economic literacy as a tool for social work, while Jappelli's (2010) approach looks more carefully at the influence of economic literacy on

participation in capital markets. From personal finance issues to aggregate economic factors, economic and financial literacy can benefit not merely individuals but also allow entire nations to flourish.

Proposal for Research

As attested to by the many authors cited above, financial and economic literacy can act as an effective tool in assisting in the development of personal financial skills and promoting economic prosperity overall. This study seeks to indicate a correlation between economic literacy and prosperity. In order to measure prosperity fully, this study will take into account human development indicators, wealth disparity indexes, and government transparency and corruption rates in addition to traditional economic measures. These humanitarian indexes are needed for supplementing prior studies that compared only financial literacy and GDP (Klapper, Lusardi, Van Oudheausden, 2016). They provide a fuller picture of the prosperity of the average citizen and help to control for factors like government corruption and wealth disparity. Because economic literacy can be used as a tool for empowering the average citizen and promoting their wellbeing (Engelbrecht, 2008), this study examines the potential for a correlation between higher economic and financial literacy rates and more stable governments with prospering economies.

Methodology

The purpose of this study is to identify a potential correlation between economic literacy and the prosperity of various nations using various measures (including some described in the literature review). Because the study is meant to take into account a wide variety of prosperity measures to gain a full picture of quality of life in various nation states, the study, in addition to traditional economic success measures, will also look at human development measures to identify connections between economic literacy and higher standards of living. Economic

literacy is defined as the ability to understand, identify, and evaluate economic concepts in relation to personal finance, the economy, and political systems (Johnson, 2013). Because data on economic literacy specifically can be ambiguous and challenging to collect, financial literacy, which is a subset of economic literacy, will be used when looking for correlations with increased national prosperity. Financial literacy is a substantial part of economic literacy and has a tremendous affect on an individual's ability to participate in economic transactions.

In order to find a correlation between economic/financial literacy and prosperity indicators, this study uses a scatter plot also called a X-Y graph. This method has been used in prior research to compare financial literacy and GDP in order to identify a relationship between the two variables (Klapper, Lusardi, Van Oudheausden, 2016). The scatter diagrams used in this study paired sets of numerical data from sources mentioned above from the Human Development Index, Geni Index, and other indexes and indicators, with one variable on each axis in order to identify any relationship that exists between the two variables used. If the variables are in fact correlated, the points on the scatter plot fall along a line or curve. The level of correlation can be judged by the proximity of the points to one another. The stronger the correlation the closer the points are to the line. This method has been used in many of the sources referenced above such as the Standard & Poor's Rating Services Global Financial Literacy Survey to compare economic literacy with other factors such as investment rates or level of urbanization. This method provides an easily interpretable image that illustrates the relationship of literacy and prosperity (*Scatter Diagram*, 2017).

This study uses prosperity indicators as the Y-axis variable. Because this study aims to capture both economic and human development, a number of factors are compared with financial and economic literacy including the human development index, the Geni coefficient, government

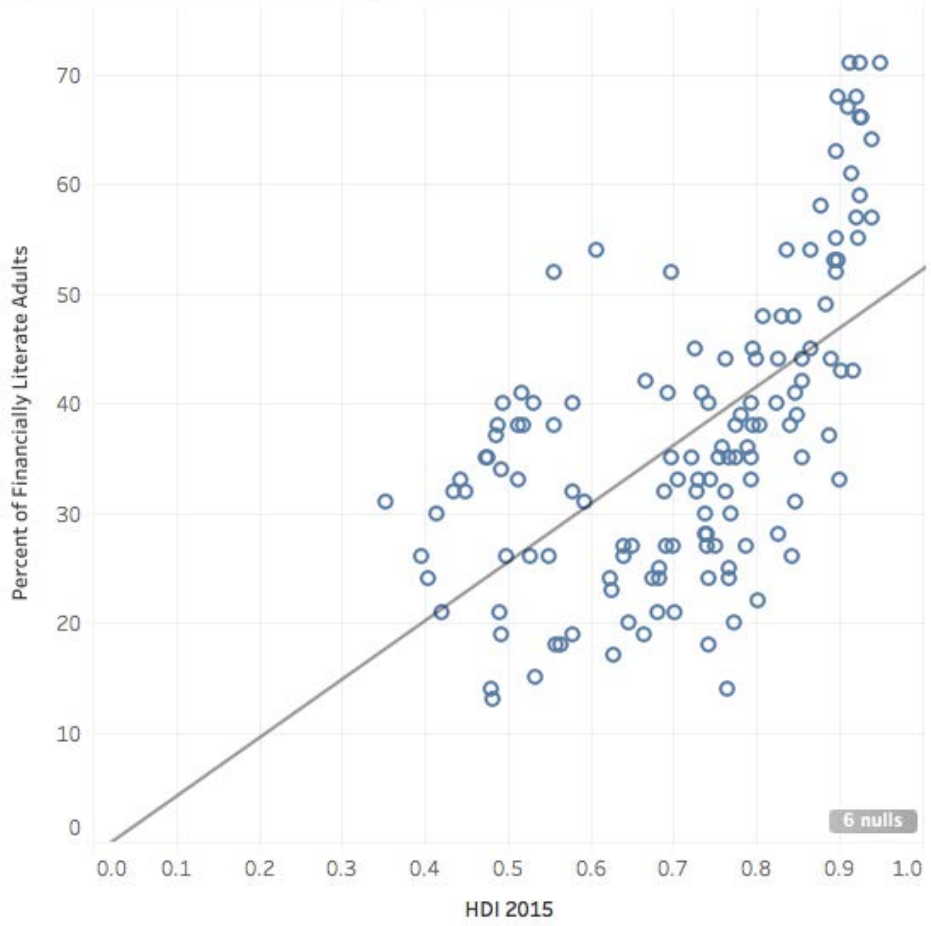
transparency, and the World Bank governance indicators (full listing of country ranking for each index found in Appendix B). Including each of these measures contributes to a full picture of the quality of life in a nation, while comparing these factors with economic and financial literacy can illustrate possible correlation and suggest the positive effect of economic literacy on the quality of life. For the X-axis this study will reference primarily financial literacy. Financial literacy is a subset of economic literacy and will be used to supplement the economic literacy rate data. Financial literacy is much more readily available and widely collected across a number of countries by organizations such as PISA and is more reliable and conclusive than data collected on economic literacy (full listing of financial literacy rankings found in Appendix A).

Findings

As mentioned earlier, because economic literacy data is limited and less quantifiable, financial literacy is used in this study as a proxy in this research for economic literacy in order to index a variety of prosperity measures and government stability indicators. Percentage of financially literate adults is taken from the S&P Global Financial Literacy Survey (Klapper, Lusardi, Van Oudheausden, 2016) that encompasses 142 countries and asks literacy questions that measure the four fundamental concepts of financial literacy—risk diversification, inflation, numeracy (interest), and compound interest in order to determine the percentage of financially literate adults (see Appendix A for detailed ranking). The highest ranked countries include Norway, Sweden, and the United Kingdom, while countries with the lowest levels of financial literacy include Tajikistan, Somalia, and Nepal (see Appendix B for detailed ranking). The results from this survey serve as a proxy for economic literacy and are used to compare with a number of prosperity indicators.

The Figure 1 compares the S&P Financial Literacy data with data from the Human Development index, provided by the United Nations development program. The human development index was created to assess the development of a country from a more holistic approach that looks at the quality of human life in addition to economic growth. The HDI scores countries based on a variety of factors including life expectancy and health, level of education, and standard of living. Countries are ranked on a scale of zero to one with one as the greatest level of human development and zero as the lowest level of human development (see Appendix B for detailed ranking). On the Y-axis of the chart found in figure 1 there are final human development scores ranging from the highest scores of Norway (.949), Australia (.939), Switzerland (.939), and Germany (.926) to the lowest scores, Chad (.396), Niger (.353), and the Central African Republic (.352) (*Human Development Reports: HDI*, 2017). The X-axis conveys the level of economic literacy for each country, indicating the percent of financially literate adults. A positive trend between financial literacy and human development also appears to exists. Countries with a higher percentage of financially literate adults tend to also rank higher on the Human Development Index.

Figure 1. Human Development Index



The Geni Coefficient represented by the Y-axis in Figure 2 is a measure for income inequality. It measures the distribution of income among individuals or household. A value of zero represents perfect equal distribution while a value of one hundred represents absolute inequality (see Appendix B for detailed ranking) (*Human Development Reports: Income Geni Coefficient*, 2017). A potential positive relationship is illustrated in the graph below by the downward sloping trend line. Countries where wealth is more equally distributed that have a Geni coefficient score that is closer to zero tend to have a higher percentage of financially literate adults.

Figure 2. Geni Index

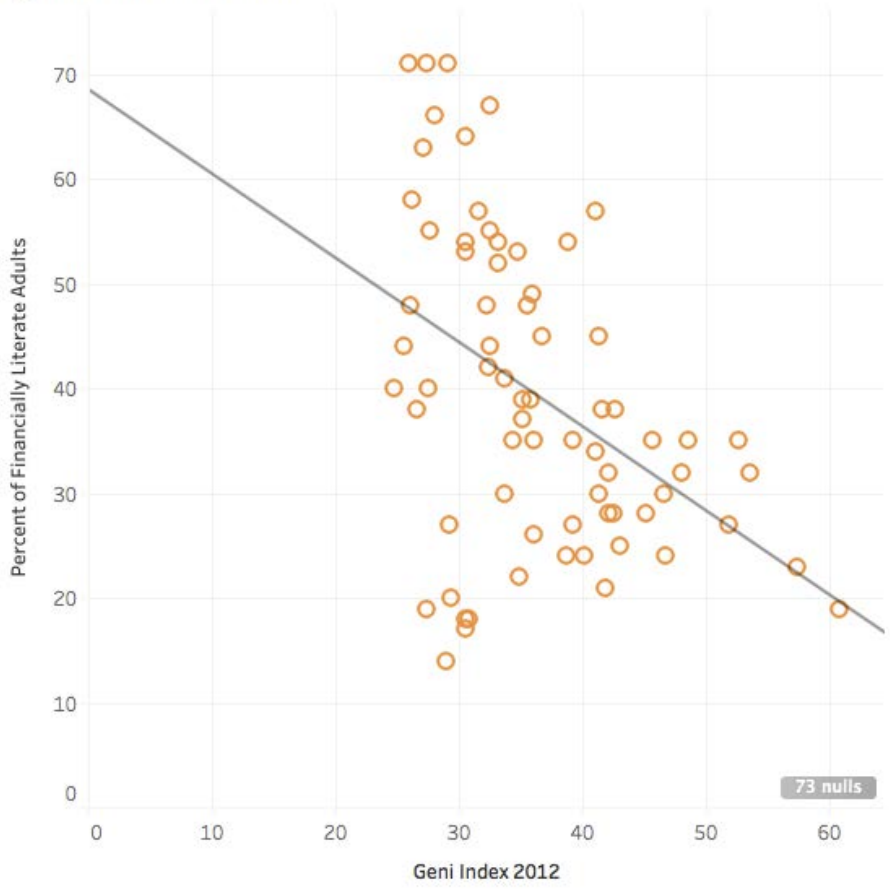
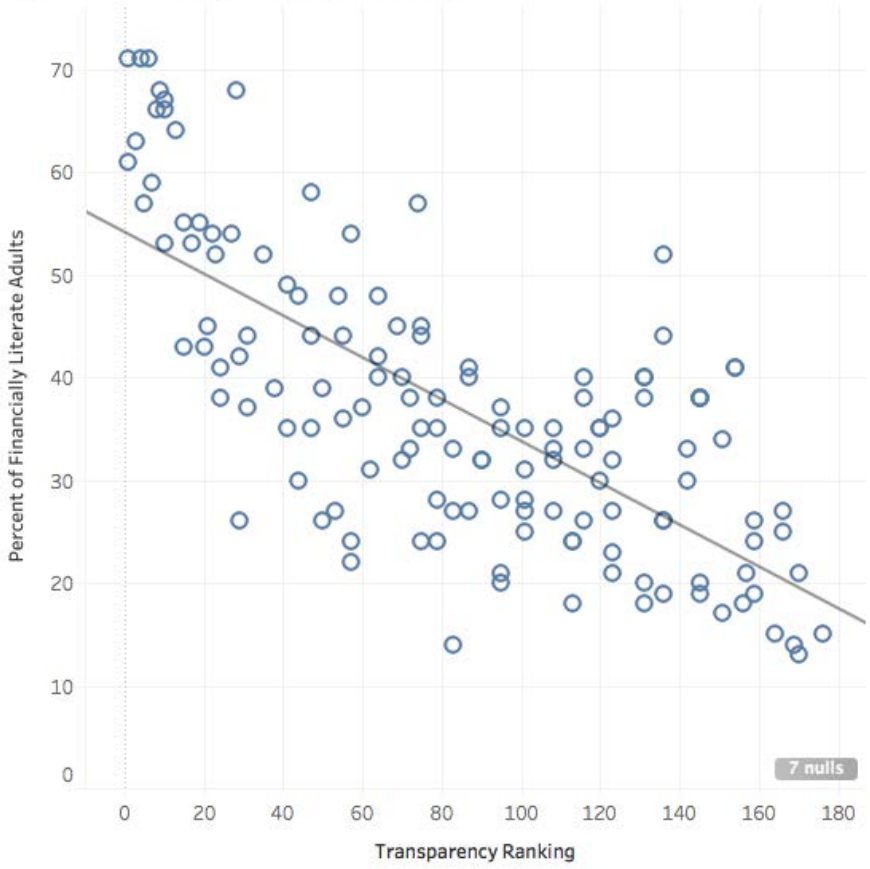


Figure 3 once again uses the percent of financially literate adults as the Y-axis, but now explores the relationship between financial literacy and each country's transparency ranking, listed on the Y-axis. Transparency is measured by the Corruption Perception Index (see Appendix B for detailed ranking). The Corruption Perception Index is provided by Transparency International and is meant to rank a wide variety of countries based on their level of corruption. This index examines 176 countries ranking them in order from most transparent to least transparent with the highest ranked countries including Denmark (number one in transparency), New Zealand (number two), and Finland number three), and the lowest ranked countries including North Korea, South Sudan, and Somalia (*Corruption Perception Index*, 2016). Figure 3 illustrates a potential positive correlation between the level of transparency and percentage of

financially literate adults. Countries with a better transparency ranking (closer to zero) tend to also have higher levels of financial literacy. This illustrates a potentially significant correlation between the level of transparency in a nation and the percent of financially literate adults.

Figure 3. Transparency Ranking



The World Bank publishes a yearly report through the Worldwide Governance Indicators project that explores six dimensions of governance and scores over 200 countries. This project measures voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. Every country is scored separately for each dimension. Indicators are based on enterprise, citizen, and expert survey responses in industrial and developing countries. Countries are scored based on over 30 individual data sources produced by survey institutes, think tanks, non-governmental organizations, international

organizations, and private sector firms (see Appendix B for detailed ranking). Figure 4 and figure 5 are based on WGI data for control of corruption (Figure 4) and political stability (Figure 5). The control of corruption index reflects perceptions of the extent to which public power is exercised for private gain including both petty and grand forms of corruption, as well as capture of the state by elites and private interests. The political stability index measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. The strength of both of these measures is estimated on a scale of -2.5 (weak) to 2.5 (strong) for governance performance. Denmark, Finland, and Luxembourg are at the top of the ranking for control of corruption while Switzerland, New Zealand, and Austria rank high on political stability. Angola, Venezuela, and Iraq all rank at the bottom for control of corruption, while Pakistan, Somalia, Yemen, and Afghanistan score the lowest for political stability (*Worldwide Governance Indicators*, 2017). As illustrated in the trend lines of both figure 4 and figure 5 there is a potentially positive correlation between financial literacy and both political stability and control of corruption. As the percent of financially literate adults in a country rises we also see higher levels of political stability and decreased corruption.

Figure 4. Control of Corruption

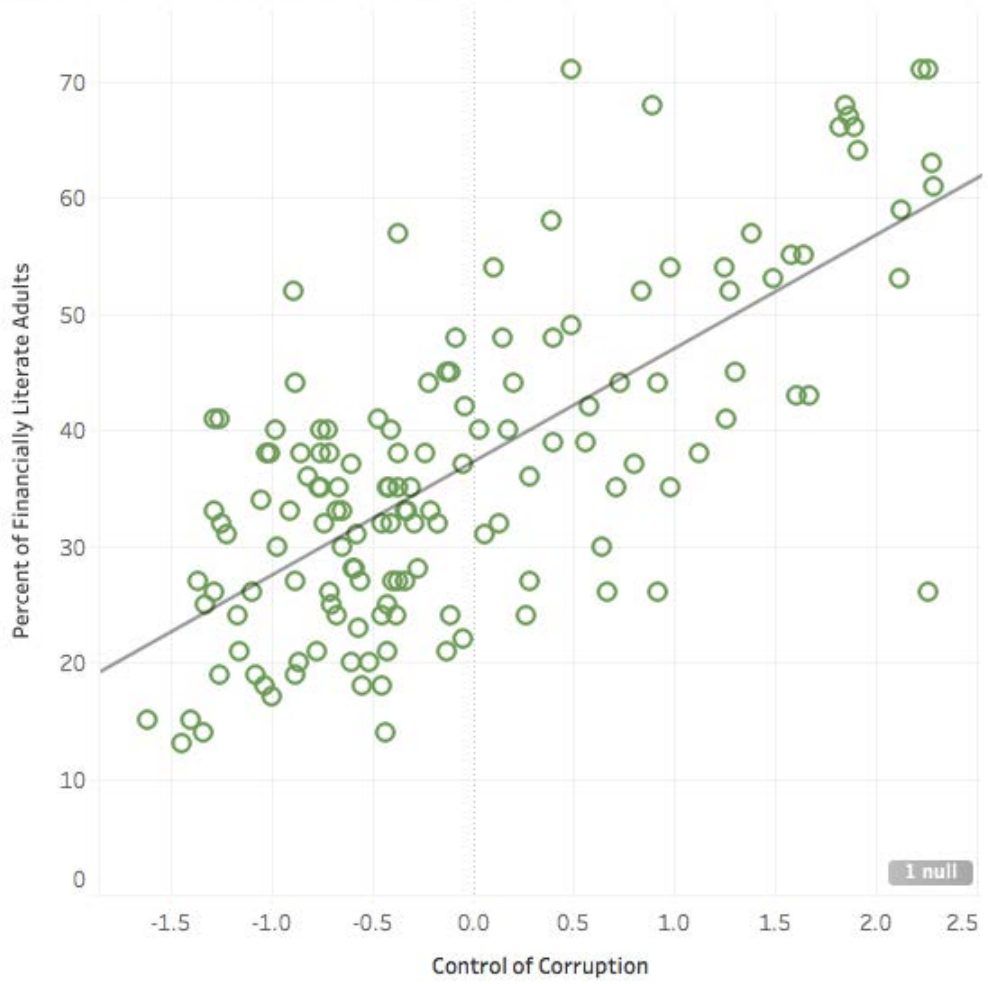
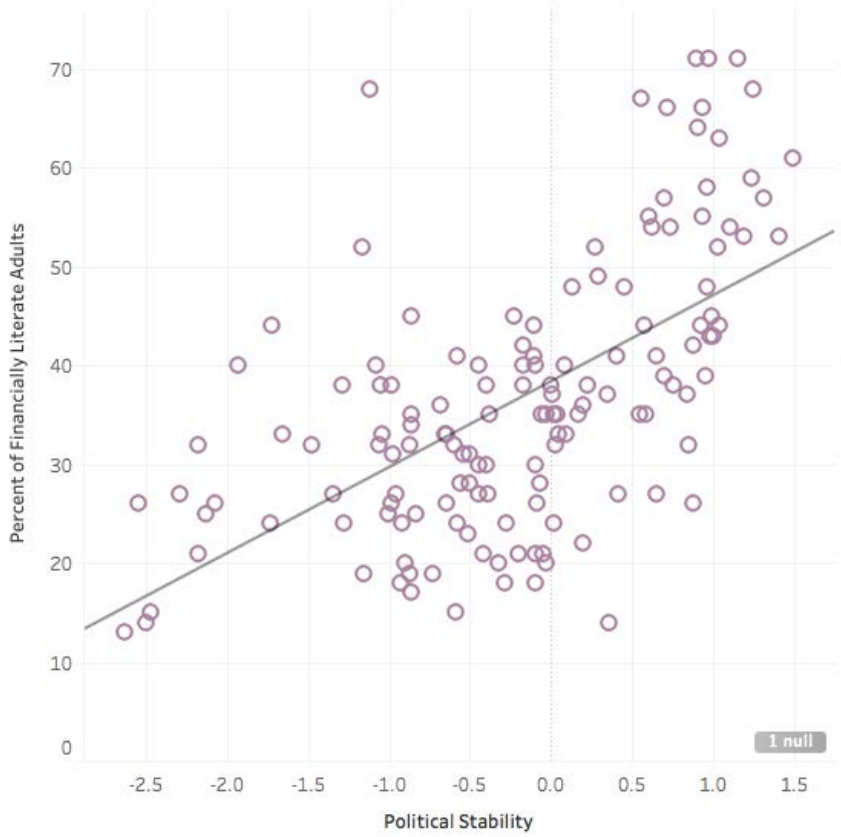


Figure 5.Political Stability



Conclusions

The findings above illustrate a potential correlation between increased human development, government transparency, lack of political corruption, presence of political stability and higher levels of financial literacy. Increased human development, government transparency, lack of political corruption, and presence of political stability are all strong indicators for the success and prosperity of a given nation that can be used to supplement traditional indicators like wealth and gross domestic product. These indicators give a clearer understanding of the quality of life for citizens living in a nation and account for issues like income and wealth disparity. Nations are constantly looking for ways to develop and achieve higher prosperity rankings. They are in search of the perfect recipe that will increase human development and create a successful nation.

There are many inputs and factors that can be used to develop a country. Financial literacy is just one of these factors that can be used for the betterment of a nation. This study illustrates the relationship between financial literacy and prosperity indicators revealing that countries with higher rates of financial literacy tend to score higher on a range of prosperity indicators. This suggests that financial and economic literacy could be the secret ingredient for a nation's recipe for success. There are of course many other factors that contribute to a nation's success and prosperity but the strong correlation between financial literacy and a number of prosperity measures suggests that financial literacy could be a great tool in promoting prosperity.

There are of course limitations to this study. Economic literacy is challenging to measure. There are very few studies that effectively measure all aspect of economic literacy across a large sampling of developed and developing nations. Studies on economic literacy and hard data are limited and therefore in this study financial literacy was used as a proxy for economic literacy because financial literacy is seen as a subset for economic literacy. Economic literacy encompasses a wider range of financial and economic issues including understanding of the economy, personal finance, and political systems.

Indicators for prosperity are also challenging to operationalize. This study uses several non-traditional prosperity indicators to give a more complete picture of a nation's overall prosperity, but these indicators are not all-inclusive. There are many other indicators for both economic prosperity and human development that could be used to illustrate prosperity levels. This study gives a small sampling of human development and prosperity indicators that are representative of a nation's overall prosperity.

This research looks indiscriminately at prosperity and financial literacy across all nations, and does not control for external factors. The purpose of this study is to look at a broad sampling

and determine correlation between prosperity indicators and financial literacy. Further research could be done to compare and determine the effect of various political systems on a nation's prosperity indicators as well as their rate of financial literacy. While this study compares nations from all different political backgrounds further research could dive into economic literacy within a group of nations from a specified political background to gauge how economic literacy affects the development of a nation within the constructs of a given political structure.

Limited data on economic literacy also leaves room for further research into the detailed aspects of economic literacy in a variety of concepts. Because economic literacy is correlated with prosperity indicators this study suggests that literacy promotes prosperity. Further research could illustrate the effect of a nation's prosperity level on their tendency for educating citizens in financial and economic matters. Income distribution and education level play a huge role in economic literacy that could be explored with further research.

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Appendix A

Percentage of Financially Literate Adults	
Country	Percent of Financially Literate (%)
Afghanistan	14
Albania	14
Algeria	33
Angola	15
Argentina	28
Armenia	18
Australia	64
Austria	53
Azerbaijan	36
Bahrain	40
Bangladesh	19
Belarus	38
Belgium	55
Belize	33
Benin	37
Bhutan	54
Bolivia	24
Bosnia and Herzegovina	27
Botswana	52
Brazil	35
Bulgaria	35
Burkina Faso	33
Burundi	24
Cambodia	18
Cameroon	38
Canada	68
Chad	26
Chile	41
China	28
Colombia	32
Congo, Dem Rep	32
Congo Rep	31
Costa Rica	35
Croatia	44
Cyprus	35
Czech Republic	58
Cote d'Ivoire	35
Denmark	71
Dominican Republic	35
Ecuador	30
Egypt, Arab Rep	27
El Salvador	21
Estonia	54
Ethiopia	32
Finland	63
France	52
Gabon	35
Georgia	30
Germany	66
Ghana	32
Greece	45
Guatemala	26
Guinea	30
Haiti	19
Honduras	23
Hong Kong SAR, China	43
Hungary	54
India	24
Indonesia	32
Iran	20
Iraq	27
Ireland	55
Israel	68
Italy	37
Jamaica	33
Japan	43
Jordan	24
Kazakhstan	40
Kenya	38
Korea Rep.	33
Kosovo	20
Kuwait	44
Kyrgyz Republic	19
Latvia	48
Lebanon	44
Lithuania	39
Luxembourg	53

Macedonia FYR	21
Madagascar	38
Malawi	35
Malaysia	36
Mali	33
Malta	44
Mauritania	33
Mauritius	39
Mexico	32
Moldova	27
Mongolia	41
Montenegro	48
Myanmar	52
Namibia	27
Nepal	18
Netherlands	66
New Zealand	61
Nicaragua	20
Niger	31
Nigeria	26
Norway	71
Pakistan	26
Panama	27
Peru	28
Philippines	25
Poland	42
Portugal	26
Puerto Rico	32
Romania	22
Russian Fed	38
Rwanda	26
Saudi Arabia	31
Senegal	40
Serbia	38
Sierra Leone	21
Singapore	59
Slovak Republic	48
Slovenia	44
Somalia	15
South Africa	42
Spain	49
Sri Lanka	35
Sudan	21
Sweden	71
Switzerland	57
Taiwan, China	37
Tajikistan	17
Tanzania	40
Thailand	27
Togo	38
Tunisia	45
Turkey	24
Turkmenistan	41
Uganda	34
Ukraine	40
United Arab Emirates	38
United Kingdom	67
United States	57
Uruguay	45
Uzbekistan	21
Venezuela	25
Vietnam	24
West Bank and Gaza	25
Yemen Rep	13
Zambia	40
Zimbabwe	41

Source: S&P Global FinLit Survey

Appendix B

Country	Geni Index 2012	HDI 2015	Transparency ranking	Control of corruption	Political Stability
Afghanistan		0.479	169	-1.34	-2.50
Albania	28.96	0.764	83	-0.44	0.36
Algeria		0.745	108	-0.68	-1.05
Angola		0.533	164	-1.40	-0.59
Argentina	42.49	0.827	95	-0.59	-0.07
Armenia	30.48	0.743	113	-0.45	-0.29
Australia	30.48	0.939	13	1.91	0.90
Austria	30.48	0.893	17	1.49	1.19
Azerbaijan		0.759	123	-0.82	-0.69
Bahrain		0.824	70	0.17	-1.08
Bangladesh		0.579	145	-0.88	-1.15
Belarus	26.53	0.796	79	-0.37	0.00
Belgium	27.59	0.896	15	1.58	0.60
Belize		0.706		-0.21	0.04
Benin		0.485	95	-0.61	0.00
Bhutan	38.81	0.607	27	0.98	1.10
Bolivia	46.7	0.674	113	-0.68	-0.28
Bosnia and Herzegovinian		0.75	83	-0.37	-0.45
Botswana		0.698	35	0.84	1.03
Brazil	52.67	0.754	79	-0.43	-0.38
Bulgaria	36.01	0.794	75	-0.31	0.02
Burkina Faso		0.794	72	-0.34	-0.65
Burundi		0.404	159	-1.17	-1.73
Cambodia	30.76	0.563	156	-1.04	-0.10
Cameroon		0.518	145	-1.03	-0.99
Canada		0.92	9	1.85	1.24
Chad		0.396	159	-1.29	-0.99
Chile		0.847	24	1.26	0.40
China	42.16	0.738	79	-0.27	-0.56
Colombia	53.54	0.727	90	-0.29	-1.06
Congo, Dem Rep	42.1	0.435		-1.25	-2.17
Congo Rep		0.592		-1.22	-0.51
Costa Rica	48.61	0.776	41	0.71	0.58
Croatia	32.51	0.827	55	0.20	0.58
Cyprus	34.31	0.856	47	0.98	0.54
Czech Republic	26.13	0.878	47	0.39	0.96
Cote d'Ivoire		0.474	108	-0.42	-0.86
Denmark	29.08	0.925	1	2.23	0.89

Dominican Republic	45.68	0.722	120	-0.77	0.17
Ecuador	46.57	0.739	120	-0.65	-0.10
Egypt, Arab Rep		0.691	108	-0.56	-1.34
El Salvador	41.8	0.68	95	-0.43	-0.05
Estonia	33.15	0.865	22	1.25	0.62
Ethiopia		0.448	108	-0.41	-1.48
Finland	27.12	0.895	3	2.28	1.04
France	33.1	0.897	23	1.28	0.27
Gabon		0.697	101	-0.67	0.03
Georgia	41.35	0.769	44	0.64	-0.40
Germany		0.926	10	1.82	0.72
Ghana		0.579	70	-0.18	0.03
Greece	36.68	0.866	69	-0.13	-0.23
Guatemala		0.64	136	-0.71	-0.65
Guinea	33.73	0.414	142	-0.97	-0.45
Haiti	60.79	0.493	159	-1.26	-0.73
Honduras	57.4	0.625	123	-0.57	-0.51
Hong Kong SAR, China		0.917	15	1.67	0.99
Hungary	30.55	0.836	57	0.10	0.73
India		0.624	79	-0.38	-0.92
Indonesia		0.689	90	-0.45	-0.60
Iran		0.774	131	-0.61	-0.91
Iraq		0.649	166	-1.37	-2.29
Ireland	32.52	0.923	19	1.64	0.93
Israel		0.899	28	0.89	-1.12
Italy	35.16	0.887	60	-0.05	0.34
Jamaica		0.73	83	-0.33	0.09
Japan		0.903	20	1.61	0.98
Jordan		0.742	57	0.26	-0.58
Kazakhstan	27.46	0.794	131	-0.76	-0.10
Kenya		0.555	145	-1.01	-1.29
Korea Rep.		0.901		-1.29	
Kosovo	29.4		95	-0.52	-0.33
Kuwait		0.8	75	-0.22	-0.11
Kyrgz Republic	27.36	0.664	136	-1.08	-0.87
Latvia	35.48	0.83	44	0.40	0.45
Lebanon		0.763	136	-0.88	-1.72
Lithuania	35.15	0.848	38	0.56	0.70
Luxembourg	34.79	0.898	10	2.12	1.41
Macedonia FYR				-0.13	-0.20
Madagascar	42.65	0.512	145	-0.76	-0.40
Malawi		0.476	120	-0.76	-0.07

Malaysia		0.789	55	0.28	0.19
Mali		0.442	116	-0.65	-1.66
Malta		0.856	47	0.92	1.04
Mauritania		0.513	142	-0.91	-0.66
Mauritius	35.84	0.781	50	0.40	0.95
Mexico	48.07	0.762	123	-0.74	-0.87
Moldova	29.16	0.699	123	-0.88	-0.39
Mongolia	33.75	0.735	87	-0.47	0.65
Montenegro	32.18	0.807	64	-0.09	0.13
Myanmar		0.556	136	-0.89	-1.17
Namibia		0.64	53	0.28	0.65
Nepal		0.558	131	-0.55	-0.93
Netherlands	27.99	0.924	8	1.89	0.93
New Zealand		0.915	1	2.29	1.49
Nicaragua		0.645	145	-0.87	-0.03
Niger		0.353	101	-0.58	-0.98
Nigeria		0.527	136	-1.10	-2.07
Norway	25.9	0.949	6	2.26	1.15
Pakistan		0.55	116	2.26	-2.54
Panama	51.9	0.788	87	-0.34	0.41
Peru	45.11	0.74	101	-0.60	-0.51
Philippines	43.04	0.682	101	-0.43	-0.84
Poland	32.39	0.855	29	0.58	0.87
Portugal	36.04	0.843	29	0.92	0.87
Puerto Rico				0.13	0.84
Romania	34.88	0.802	57	-0.05	0.20
Russian Fed	41.59	0.804	131	-0.86	-1.05
Rwanda		0.498	50	0.67	-0.08
Saudi Arabia		0.847	62	0.06	-0.54
Senegal		0.494	64	0.03	-0.17
Serbia		0.776	72	-0.24	0.23
Sierra Leone		0.42	123	-0.78	-0.10
Singapore		0.925	7	2.13	1.24
Slovak Republic	26.12	0.845	54	0.15	0.96
Slovenia	25.59	0.89	31	0.73	0.92
Somalia			176	-1.62	-2.47
South Africa		0.666	64	-0.04	-0.18
Spain	35.89	0.884	41	0.49	0.29
Sri Lanka	39.16	0.766	95	-0.37	-0.03
Sudan		0.49	170		-2.17
Sweden	27.32	0.913	4	0.49	0.97
Switzerland	31.64	0.939	5	-0.37	1.31
Taiwan, China			31	0.80	0.84

Tajikistan	30.52	0.627	151	-1.00	-0.87
Tanzania		0.531	116	-0.72	-0.45
Thailand	39.26	0.74	101	-0.40	-0.96
Togo		0.487	116	-0.71	-0.17
Tunisia		0.725	75	-0.11	-0.87
Turkey	40.17	0.767	75	-0.11	-1.28
Turkmenistan		0.692	154	-1.26	-0.11
Uganda	41.01	0.493	151	-1.05	-0.86
Ukraine	24.74	0.743	131	-0.98	-1.93
United Arab Emirates		0.84	24	1.12	0.76
United Kingdom	32.57	0.91	10	1.87	0.56
United States	41.06	0.92	74	1.38	0.70
Uruguay	41.32	0.795	21	1.30	0.99
Uzbekistan		0.701	157	-1.16	-0.42
Venezuela		0.767	166	-1.33	-1.01
Vietnam	38.7	0.683	113	-0.45	0.01
West Bank and Gaza				-0.70	-2.13
Yemen Rep		0.482	170	-1.45	-2.63
Zambia		0.579	87	-0.41	0.09
Zimbabwe		0.516	154	-1.29	-0.58

Source: Human Development Reports: Income Gini Cofefficient, HDI. World Bank: World Governance Indicators