The Influence of Culture on Sovereign Credit Risk Perception

by

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ABSTRACT

This thesis seeks to understand the role of culture in sovereign credit risk perception. In particular, it will look into Hofstede's 5-factor dimension model and its relationship to bond yields and S&P credit ratings. Hofstede simplified the complex idea of culture into these five factors that are unique to every country. His dimensions include: Individualism Index, Power Distance Index, Masculinity Index, Long-Orientation Index, and Uncertainty Avoidance Index. Individualism refers to the propensity for a culture to put the needs of a group over the individuals. Power Distance quantifies the importance of hierarchy in a country. Long-term orientation measures the weight a culture gives to the future when making decisions or taking actions. Masculinity looks into the competitiveness of a culture and the importance of gender roles. The Uncertainty Avoidance Index is used to gauge how comfortable a country is with uncertainties.

This paper discovers that culture plays no role in determining sovereign credit risk. When regressed independently against S&P ratings and bond yields, only the cultural dimensions Individualism and Uncertainty Avoidance Index proved statistically significant. However, when regressed on a larger scale, with all economic variables that credit rating agencies take into account for credit valuation, the cultural dimensions quickly lost their effects. This proves that culture very rarely affects valuation of sovereign credit risk. In the end, economic indicators are still more heavily utilized to predict country's sovereign risk.

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I. INTRODUCTION

Culture has many definitions. The most widely accepted is "the complex whole of knowledge, beliefs, arts, morals, law, custom and habits acquired by humans as members of a society " (Ramin, Firoz and Kwarteng 2010). Culture is a group phenomenon – it is a set of rules and way of thinking created when people congregate together. It can overlap – a corporate culture can exist within a community culture, and the community culture exists within a national culture. It can also change over time. However, though the rules themselves may transform with time, the fundamental principles underlying them – *culture* – remain constant. Culture is incredibly important because it guides the way people live. People's priorities, perceptions and actions are shaped by the culture they accept.

Culture also influences a society's economy. The ways that people view money and deal with their finances are directly affected by their culture. Ramin, Firoz and Kwarteng (2010) discovered that relative wealth of a country is positively correlated with two cultural dimensions: Individualism and Uncertainty Avoidance. Countries with highly individualistic cultures, where the priorities of the individuals are prioritized over that of a group, and countries with low avoidance of uncertainty, where people are very comfortable with uncertainty, tend to be wealthier than countries on the opposite end of the spectrums[1].

By this line of thought, culture should also directly affect the way a nation's government handles its finances. Instead of solely looking at the relationship between a country's economic welfare and its sovereign risk, this paper seeks to find a connection between a country's culture and its credit risk. If a country's culture can predict its wealth, then it should be able to predict *how* a country deals with debt as well.

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[1] Ramin, Taghi, Nadeem M. Firoz, and Alex P. Kwarteng. "The Effect of Culture on the Relative Wealth of Countries: An International Study." *International Journal of Management* 27.2 (2010): 267+. Print.

II. COUNTRY RISK ASSESSMENT

In the past, countries raised money by taxing their citizens, conquering new lands, or acquiring gold, precious metals and valuable goods for trade. This was extremely limiting. The creation of financial markets invented new ways to raise capital and generate value. Countries are now able to use bonds to finance their expenses by selling future cash flows. In order to correctly price these bonds, it is important to value the risk of these countries.

Just like companies, different countries have different risk levels. Countries with healthy trade, wealthy, taxable citizens and sound investment decisions have more consistent 'cash flows' that allow them to pay back debt. Countries with unstable income, from political instability, or poor returns on capital tend to be riskier than others. Unlike companies however, country risks are slightly more difficult to measure. This is because governments are not solely dedicated to generating value for shareholders; a country's first and foremost responsibilities are to its citizens. Furthermore, governments are subject to other concerns such as political conflicts, social unrest, and international relationships that can compromise their ability to pay back debt.

Countries with lower risk have lower borrowing costs, while countries with high risks have higher borrowing costs. One of the most accepted ways to value country credit is to look at credit rating agencies. The most famous of which are: S&P, Fitch Ratings and Moody's. These agencies have enormous influence on interest rates of bonds. Their credit assessments are important in determining a nation's access to the capital markets as well as its borrowing cost[2].

However, rating countries is still a relatively new practice. The tradition of rating countries began in 1970s, when S&P and Moody's began by rating the U.S., Canada, and

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[2] Eijffinger, Sylvester C.W. "Rating Agencies: Role and Influence of Their Sovereign Credit Risk Assessment in the Eurozone." *Journal of Common Market Studies*50.6 (2012): 912+. Print.

Australia. The practice took off in 1980s and 1990s, and grew to 100 countries by 2000[3]. Credit Rating Agencies have been criticized heavily for opaque methodologies when it comes to sovereign credits. All agencies claim to use the same variables for gauging risk. However, Eijffinger (2012) discovered that, while credit rating agencies assert that they use the same economic indicators to value countries, their ratings proved to have a statistically significant difference. When regressed, differences were attributed to a "subjective, qualitative" bias that the agencies placed on the companies. This paper seeks to understand if culture could be the key to the "subjective" variable.

III. CREDIT RATING AGENCIES' METHODOLOGY

The Global Recession of 2007 and European Debt Crisis of 2011 triggered the discussion of accurate sovereign credit assessment. Fitch Ratings and S&P Ratings downgraded United States' sovereign credit in the summer of 2011 from AAA to AA+. This action was motivated by the mortgage crisis of 2008, when trillions of dollars worth of mortgage-backed securities defaulted. As real estate bubbles popped, large banks also went into bankruptcy. The United States government was forced to choose between bailing out these companies or risk mass unemployment and credit freeze. Companies began hoarding capital and people stopped spending money. The economy spiraled into a recession. The Federal Reserve issued quantitative easing to lower borrowing costs and encourage consumer spending.

The United States recession created a contagion effect that also affected European countries. Soon, Spain, Portugal, Greece and Ireland also faced sovereign debt issues. The credit rating agencies did not hesitate to downgrade the countries' debt ratings. As the recession progressed, it became increasingly evident that economic parameters were not indicative of

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[3] Iyengar, Shreekant. "The Credit Rating Agencies - Are They Reliable? A Study of Sovereign Ratings." *Vikalpa* 17.1 (2012): 69+. Print.

sovereign credit. For example, debt-to-GDP ratio is no longer a very useful variable for gauging

debt sustainability. Although Reinhart and Rogoff warns that 85-90 percent represent a danger

zone[4], and most literature dictate a "perfect" ratio of 60%, the fact of the matter is that real debt

levels seem to have no effect on investor confidence. Spain and the United States have almost

identical debt-to-GDP ratios (with Spain actually a bit lower), yet Spain's fiscal crisis drove its

10-year bonds over 7 percent, highly above sustainable levels. This exacerbated itsrecession and

pushed the unemployment rate to 30%. The European Central Bank had to implement austerity

matters to provide support for the dire situation in the bond market. Meanwhile, though at a

similar level of debt, the U.S. 10-year bond remains steadily below 3%. This paper seeks to

understand if culture influences the way investors react to different countries' recessions.

Graph 1 depicts the relationship between debt to GDP ratio of countries and their credit

ratings. While intuitively, countries with higher debt to GDP ratios should have lower credit

ratings (thus, a higher score on this scale), the relationship appears very random. It is evident that

the economic indicator, debt, plays a small role in investor confidence.[5]

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[4] Reinhart, Carmen M., and Kenneth S. Rogoff. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton: Princeton UP, 2009. Print.

[5] Makin, John H. "Trillion-dollar Deficits Are Sustainable for Now, Unfortunately." *www.aei.org*. American Enterprise Institute, 13 Dec. 2012. Web. 30 Apr. 2013.

Graph 1: Debt to GDP ratio vs. S&P Rating
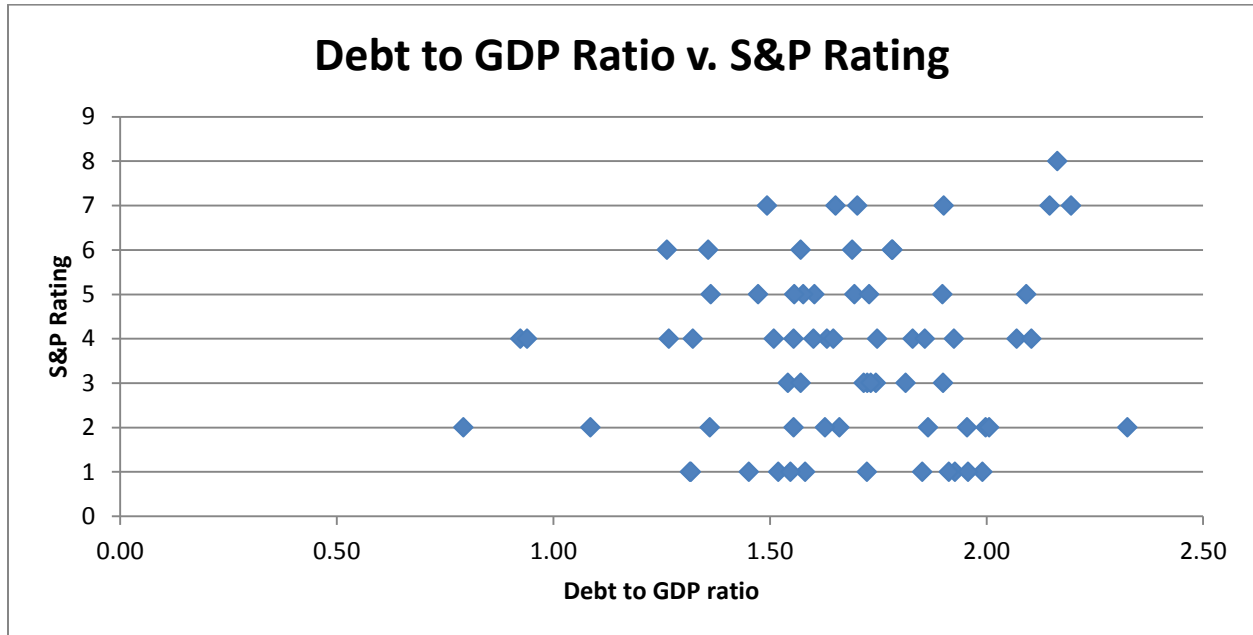
Graph 1 depicts the relationship between Debt-to-GDP ratios and S&P ratings. S&P ratings have been quantified such that lower ratings have higher numbers (AAA =1, AA+ = 2, etc…). While intuitively, we would expect a more positive linear relationship, this graph shows the randomness of the true relationship.
Source: Trading Economics

In addition, as indicated by the Table 1, while S&P ratings and bond yieldsare highly correlated, both variables do not have meaningful relationships to Debt-to-GDP ratios.

Table 1: Correlation Matrix

	Log(Debt to GDP)	*S&P Rating*	*Bond Yield*
Log(Debt to GDP)	1		
S&P Rating	0.0942	1	
Bond Yield	0.1144	0.7185	1

Table 1 shows the correlation matrix among Bond Yield, S&P Rating and Dept to GDP ratio. It is evident that the correlation between Debt to GDP ratio is very low for both Yield and S&P rating. S&P and Bond Yield, however, are highly correlated.

Therefore, it is important to consider that economic indicators utilized by credit rating agencies are not always reflective of the agencies' ratings. The disruption in sovereign debt markets caused by credit ratings – such as Spain's downgrade and Austria, France and Italy's expected downgrades in late 2011 and early 2012 – underscores the importance of credit rating

agencies. Downgrade of debt or even announcements of possible downgrades, can heavily influence the sovereign markets and undermine austerity measures. Thus, it is clear that, regardless of its accuracy, sovereign credit ratings play an integral role in fostering investor confidence. These incidents provoked a number of literatures critiquing the current credit rating methodology.

Eijffinger (2012) discovered that credit rating agencies play a significant role in the borrowing costs of country; however, he also found that ratings tend to *follow* crisis, rather than *lead* them. This hints that the current valuation methods employed by credit rating agencies are inefficient, and could be improved. Eijffinger (2012) presented evidence that while the credit rating agencies look into multiple variables such as inflation, GDP growth, and other economic factors, the "subjective" variable, an estimation dictated by the agencies that is not revealed to the public, is statistically significant. This paper seeks to understand if culture can explain this subjective variable.

IV. CREDIT RATING METHODOLOGY

Sovereign credit ratings attempt to gauge the willingness and ability of a country to fulfill its future debt obligations. Credit rating agencies use a combination of economic factors, such as inflation and GDP growth, as well as a qualitative assessment of the country's political and social forecast. The agencies provide a list of indicators that are considered for analysis. Cantor and Packer (1996) distilled these factors and also described their relationships to country solvency.

GDP per capita (US$): GDP per capita is directly related to the country's ability to serve its debt. Higher level of per capita income suggests a large tax base that the borrowing

country can utilize for debt repayment. Countries with higher GDP per Capita are typically rated higher.

Real GDP Growth: Higher GDP growth indicates better ability for the country to service its existing debt burden over time. Countries with growing standards of living and income are better able to weather economic and political shock compared to stagnant economies. Typically, medium-level, speculative grading countries show the highest levels of growth due to more attractive economic prospects and policy flexibility. Conversely, developed countries, with high rankings, do not have very high GDP growth.

Inflation (Consumer Price Index): Countries using inflationary monetary finances are associated with unwillingness to pay its debt through tax or debt issuance. Well-developed and transparent markets are supported by more flexible monetary policy and lower inflation rate. Meanwhile, countries with weak financial sectors and undeveloped capital markets typically have higher inflation rates. Thus, countries with high inflation are given lower level rating and vice versa.

Fiscal balances: Fiscal balance is calculated by subtracting a country's expenditures from its revenues. Fiscal deficits are associated with a government's unwillingness to tax citizens to service debt obligations and cover expenses. However, beyond a simple interpretation of 'surplus' and 'deficit', revenue; expenditure flexibility and effectiveness of expenditure programs also play a role. For example, if a country has significant financing needs, but focuses investments on public infrastructure that sustains economic growth, then it will still receive a higher rating. Therefore, this is a more complicated variable that requires some subjective interpretation.

External balances: This indicator is measured by current account balance as a percentage of current account receipts. Countries with high external balances demonstrate a reliance on funds from abroad. This ratio tends to be positive for creditworthy sovereigns and negative for least creditworthy nations.

External debt: External debt considers: private sector debts, equity liabilities of public sector, and external indebtedness denominated in local as well as foreign currency earnings. It is the total public and private debt held by a government. This is measured by the ratio of external debt to a country's current account receipts. Countries with higher ratio are associated with lower credit ratings.

Economic development: Economic development supplements the per capita income measurement. Credit rating agencies consider the relationship between economic development and risk. For example, once a country reaches a higher income level, they are regarded as less likely to default.

Default history: Default is defined by as a "failure to meet a principal or interest payment on due date" by Moody's. A government that fails to pay scheduled debt payments or tenders an "exchange offer of new debt with less favorable terms than the original issue" (Cantor and Packer, 40) is perceived as "defaulting." Hence, countries that have had a history of defaulting are considered higher credit risk sovereigns[6].

In addition to economic factors, credit rating agencies also incorporates qualitative, subjective interpretations of the country. This parameter is measured by the "stability, predictability and transparency of the country's political institutions" (Cantor and Parker, 41). Countries with more established and effective governance are given higher grades. This is

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[6] Cantor, Richard, and Frank Packer. "Determinants and Impact of Sovereign Credit Ratings." *The Journal of Fixed Income* 6.3 (1996): 76-91. Print.

because higher rated countries are seen as able to weather political and external shocks better than nations with lower ratings.

Credit rating agencies attribute different weights to each variable to assess the credit worthiness of a country. This weighting methodology is not revealed to the general public. In order to understand the significance of qualitative assessments, Iyengar (2012) analyzed the various factors, and attributed an arbitrary "dummy" variable to account for the "subjective qualitative" factors. He found that while all three credit rating agencies use the same economic variables, there are differences in their ratings. These differences can be attributed to the subjective variables utilized. Credit rating agencies claim to attribute a large part to political factors– such as government instability or social unrest.

However, Haque, Mark and Mathieson (1998) analyzed the importance of the political factor in sovereign credit risk ratings. Their model incorporated political events as variables and found that agencies are mainly concerned with a country's capacity to service debt. Hence, unless the political event directly compromises the ability to do this, it is not influential on credit ratings. This means that the qualitative variable utilized by countries extends beyond just political oriented factors, but *others* as well. The United States recession and Japan's current stagflation hint towards the potential of culture's role in credit risk perception.

V. CASE STUDY: UNITED STATES AND JAPAN

The United States' Great Recession in 2007was eerily similar to what occurred in Japan two decades ago. Both countries experienced real estate bubble bursts, quickly followed by ballooning deficits, public debt, and a decline in interest rates. Both governments stepped in to prop up ailing banking industries, and both spiraled into a recession with high unemployment rate.

While the situations are similar, Japan has been struggling to recover since the 1990s. Yet

its sovereign debt remains at AA- with a negative outlook[7]. Meanwhile, the United States has

been dealing with its recession for five years, its debt has been downgraded to AA+ and the

outlook remains challenging. However, optimistic news from the housing industry and

burgeoning stock market hints at a much faster recovery[8]. The United States government reacted

quickly to the recession. Yet, what underlies the motives behind the austerity measures employed

by the government? The key could be the different cultures of the countries. In order to truly

understand culture, we will look towards one of the most frequently cited works in history:

Hofstede's Five Factor Dimensions.

VI. HOFSTEDE'S FIVE-FACTOR DIMENSIONS

The Hofstede's five factor dimensions is one of the most cited works for analyzing

cultural patterns. Published in 1980, the study examined work-related values of 116,000

employees from IBM and its subsidiaries across different nations. The framework reduced the

complexity of culture into four dimensions: Power Distance, Individualism, Masculinity,

Uncertainty Avoidance[9]. Hofstede's substantiated studies only include research on 76 countries.

A fifth dimension, Long-term Orientation, based on Confucian dynamism, was added in 1991

based on research by Michael Bond. This research was further extended based on Michael

Minkov's analysis of the World Value Surveys in 2010. A sixth dimension was also added in

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[7] Sposato, William. "UPDATE: S&P Maintains Japan's Rating, Keeps Negative
Outlook."*Online.wsj.com*. Wallstreet Journal, 18 Feb. 2013. Web. 30 Apr. 2013.

[8] Bovino, Beth A. "U.S. Economic Forecast: Like a Box of Chocolate."*Www.standardandpoors.com*.
S&P Ratings, 19 Feb. 2013. Web. 30 Apr. 2013.

[9] Ramin, Taghi, Nadeem M. Firoz, and Alex P. Kwarteng. "The Effect of Culture on the Relative Wealth
of Countries: An International Study." *International Journal of Management* 27.2 (2010): 267+. Print.

2010, called Indulgence and Restraint, based purely on World Values Surveys. However, due to the novelty of the idea, I will not be using it in my analysis[10].

Power Distance (PDI) is defined as the "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally"(Hofstede 1994). This dimension analyzes people's acceptance of hierarchy within their existing culture. High power distance cultures tend to have greater emphasis on hierarchy. These societies tend to have caste-systems; wealth and power create greater distinction in treatment. Low power distance cultures accept equality and emphasize opportunities for all. While hierarchy still may exists, there is much less rigidness in treatment.

Individualism (IDV) refers to "societies in which the ties between individuals are loose; everyone is expected to look after himself or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty" (Hofstede 1994). Individualistic countries tend to emphasize the welfare of the individual, and smaller sub-groups within a society. Meanwhile, collectivism cultures stress the importance of the whole group.

Masculinity (MAS) "pertains to societies in which social gender roles are clearly distinct; feminity pertains to societies in which social gender roles overlap" (Hofstede 1994). Masculine cultures tend to have more males in power and decision-making positions. . Meanwhile, countries that score lower on the masculinity scale tend to stress gender-equality. More masculine countries also tend to be more competitive than more feminine countries.

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[10] Geert Hofstede, Gert Jan Hofstede, Michael Minkov, Cultures and Organizations: Software of the Mind. Revised and Expanded 3rd Edition. New York: McGraw-Hill USA, 2010

Uncertainty Avoidance Index (UAI) focuses on "the extent to which the members of a culture feel threatened by uncertainty or unknown situations" (Hofstede 1994). Countries that score high on the uncertainty avoidance index indicate that members of the society are less tolerant of uncertainties and ambiguities. These countries are more rule-oriented and inflexible in the face of changes. Countries that score low on the uncertainty avoidance index are more comfortable with changes. High uncertainty avoidance countries do their best to eliminate the unknowns in every situation and tend to take a long time making decisions.

Long-Term Orientation (LTO) is the fifth dimension that Hofstede added to the original four factors above. The research concerning LTO is not as extensive, however, it is still an important characteristic. LTO deals with "virtue regardless of Truth, Values associated with LTO are thrift and perseverance, values associated with Short Term Orientation are respect for tradition, fulfilling social obligations, and protecting one's 'face'. Both the positively and the negatively rated values of this dimensions are focused on the teachings of Confucius, the most influential Chinese philosopher who lived around 500 B.C. (Hofstede 1994). " Long-term orientation countries tend to carry out actions that keep the future in mind while short-term orientation cultures are more concerned with immediate results and situations.

Hofstede's five dimensions simplify the complexity that is culture. Culture is *relative*. The ratings exist based on the country's standings relative to other countries. Culture influences the way that people live, and the way people treat finances.

VII. UNITED STATES VS. JAPAN

Graph 2 compares Japan and United States' scores on Hofstede's five factor dimensions. In order to truly understand what motivated the way Japan and the United States dealt with the recession, it is important to first understand the differences between the two cultures.

Graph 2: United States vs. Japan on Hofstede's 5 Factor Dimensions

PDI refers to Power Distance Index, the higher a country scores, the larger the propensity of individuals to respect authority and hierarchy. INDV refers to Individualism Index. It measures how much a culture values the group over the individuals. The higher a country scores, the citizens are typically more independent. MAS refines to the Masculinity Index, a country with a high score in this area is typically more competitive and adheres closely to gender roles. UAI stands for Uncertainty Avoidance Index; a country that puts emphasis on eliminating uncertainties in its environment typically scores higher on this index. LTO refers to the Long-Term Orientation of a culture. A culture that scores high in this area tends to puts a lot of emphasis on the future, and takes on a long-term perspective when taking action[11].
Source: Hofstede

      Power Distance is the most similar dimension that the United States shares with Japan. At

the score of 54, Japan is a country *mildly* concerned with hierarchy. Yes, the Japanese care about

pecking order, however, they are not nearly as power-oriented as most other Asian countries.

The Japanese do take a long time to make a business decision, mainly due to their wish to garner

mass acceptance. However, this also shows that no *one* individual makes decisions in Japan.

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[11] Geert Hofstede, Gert Jan Hofstede, Michael Minkov, *Cultures and Organizations: Software of the Mind.* Revised and Expanded 3rd Edition. New York: McGraw-Hill USA, 2010

Furthermore, Japan has a meritocracy culture. This means that all worthy and credible people are given opportunities to gain power or wealth.

On this scale, the United States is given a rating of 40. This is a reflection of the United States' stance on equality and opportunities for all. American companies tend to have hierarchies due to convenience. Managers are still highly accessible, and decisions are often made base on consensus. Information is shared equally and communication can be informal, direct and participative. Both the United States and Japan are dedicated to creating a harmonious, meritocracy environment for their citizens.

In terms of Individualism, Japan scored 46. This means that Japan is highly group oriented although it does retain some individualistic characteristics. Japan emphasizes putting the harmony of the group above the individual, and shuns the idea of "losing face" in front of peers. However, it is definitely not as collectivism-oriented as its other Asian neighbors. In practice, the Japanese are highly loyal to their inner group – such as extended family and their local community – while they may not exhibit the same collectivism on a larger scale[12].

Conversely, the United States scored 91, making it one of the most individualistic countries in the world. This high score means that the United States has a loosely knit society in which most individuals are concerned with his or her immediate families. In the American society, people are expected to be self-reliant and forge their own success based on demonstrated initiatives. Furthermore, hiring and promotions are based on merit rather than on family connections. In Japan, there is still a more collective group mentality. This can often cause groups to suffer when trying to care for all.

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[12] Geert Hofstede, Gert Jan Hofstede, Michael Minkov, *Cultures and Organizations: Software of the Mind.* Revised and Expanded 3rd Edition. New York: McGraw-Hill USA, 2010

At 95, Japan has one of the most masculinity-oriented societies in the world. This mainly means that competition and success is important. In Japan, children are taught from a very young age to compete for the best grades, to attend the best universities and attain the most lucrative careers. This culture also emphasizes gender roles. Hence, it is more difficult for women to climb the corporate ladder in Japan in comparison to their male counter parts.

However, the United States only scored a 62 on the masculinity scale. In a feminine society, people are more concerned with quality of life and caring for others. In a masculine society, the society is driven by success, competition and achievement. The United States *is* considered a "masculine" society, where people are most concerned with success and individual needs than that of the whole. In the U.S., people are judged based on merit. However, the score is not as high as Japan because Americans are concerned with quality of life, and caring for others. Furthermore, gender equality is more accepted in the States.

On the Uncertainty Avoidance Index, Japan also achieved a high score of 92. This means that Japan is one of the most uncertainty avoiding countries in the world. This may be due in part to its geographic location; Japan is regularly threatened by natural disasters such as hurricanes, tsunamis and earthquakes. Japan takes great efforts to be prepared for emergencies and eliminate the uncertainties in its environment. Managers try to gather all information before implementing policies. This is why it is often difficult to instigate changes in Japan[13].

On this Index, the United States only scored a 46, which means that the American people are highly comfortable with uncertainty. Americans tend to accept new ideas, innovative products or inventive technologies. At the same time, Americans are not as rule-oriented and

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[13] Geert Hofstede, Gert Jan Hofstede, Michael Minkov, Cultures and Organizations: Software of the Mind. Revised and Expanded 3rd Edition. New York: McGraw-Hill USA, 2010

accept freedom of expression for all. This gives Americans a lot more flexibility when it comes to business decisions and practices.

At 80, Japan is also a highly long-term oriented culture. This means that the Japanese view themselves as part of the long history of life, "people live their lives guided by virtues and practical good examples" (Hofstede 1994). This dimension is reflected in the high R&D Japanese engage in even in economically difficult time. The idea is that, companies do not just exist solely to increase money every quarter for shareholders, but instead to serve stakeholders and generations going forward.

The United States scored a 29 on this dimension, which means it is a short-term oriented culture. American businesses are more concentrated on producing results on a short-term basis. Most profit-and loss statements are issued on a quarterly basis and quick results are desired. This is a large contrast to Japan, which prefers a long-term view.

VIII. CULTURE'S ROLE IN THE ECONOMY

After a devastating defeat in World War II, Japan was a country beaten and poor. However within years, Japan had reinvented itself to be a prosperous country, poised to overtake the United States economy. In the 1980s, the Japanese economy was growing at a rapid pace, Japanese companies were making a name for themselves in the global economy and the Nikkei Index had never been higher. Yet, by 1990, Japan was a shadow of its former self. Japan was plagued by a daunting recession and a large, unsustainable government debt, a burden that has been continuously growing in the past two decades. A far cry from its former glory, Japan's current economy struggles with deflation, stagnant growth, high employment and an unprecedented debt level of more than 200%.[14]

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[14] Makin, John H. "Japan's Lessons for America's Budget Warriors." *Www.aei.org*. American Enterprise Institute, 29 Jan. 2013. Web. 30 Apr. 2013.

In the Great Recession mid-2007, the United States faced very similar problems to Japan. Both countries had real estate bubbles and a defective banking system. Furthermore, both Japan and the United States had large, unsustainable and growing public debt loads. Many critics feared that America will follow the steps of Japan. However, the United States appear to be recovering steadily from the recession. This may be due to the fact that the cultures of these countries motivated them to deal with fiscal problems in very different ways.

One of the key reasons Japan's recovery had been such a slow process is the country's collectivist and long-term oriented culture. The government tries to care for all, and puts the priorities of the group above the individual. When the banking industry faltered in the 1990s, instead of letting these companies fail, the Japanese government stepped into guarantee any faulty loans. It started when Ripplewood, a Wallstreet Fund purchased Long-Term Credit Bank of Japan for US $1.2 bn in 2000, the government promised to compensate any of the loans that went bad. This gave Ripplewood every incentive to pour through the financial statements and default bad loans[15]. Japan's incentive structure was not aligned to motivate companies to try and improve themselves. This practice led to an era of supporting zombie-companies, firms that do not generate enough return on investments to sustain themselves, that hemorrhage government money.

The United States bailouts of banks such as Citigroup emulated the Japanese's government intervention. However, the difference is that the United States government did *not* spend its money propping up *all* banks; it allowed companies like Lehman Brothers or Bear

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[15] Banyard, Peter. "A Tale of Two Systems." *Credit Management* 4 (2004): 22-23. Print.

Stearns to go bankrupt. Therefore, the individualistic nature of the United States motivates it to continue encouraging competition.

Furthermore, the responses of citizens were very different. The Japanese Government has been continuously borrowing and growing the government fund in the last two decades. While the Japanese people's taxes have gone up and employment is still uncomfortably high, the citizens have been very passive about the situation. Japanese pension funds, insurance companies and institutional investors still view the government as very safe. Both the government and the people take long-term perspectives. Citizens are not concerned with low interest rates; they believe that eventually the country will recover[16].

On the other hand, the U.S. government has been faced with aggressive responses from the American people and Congress. Congress demanded measures to cut down on spending and increase taxes. It did not hesitate to establish boundaries, "fiscal cliffs" to restrain the government. The United States people expect fast results, and the government's policies reflect this. This pro-active nature of the American people can be credited for the United States' slow but stable recovery from the recession[17].

Japan also has a unique culture, in which companies are still highly masculine. This conflicts directly with the government's collectivist nature. This means that the companies and individuals tend to seek personal solutions for economic problems rather than support government efforts. Schoppa (2010) provides an interesting theory that, in the past, Japan had been too poor to be selfish. People relied on the government to harness group efforts, and the

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[16] Schoppa, Leonard F. "Japan, the Reluctant Reformer." *Foreign Affairs* 80.5 (2001): 76-90. Print.

[17] Hook, Janet, Corey Boles, and Siobhan Hughes. "Congress Passes Cliff Deal." *Www.wsj.org*. Wallstreet Journal, 2 Jan. 2013. Web. 30 Apr. 2013.

Japanese worked hard to make sure that the State implemented policies that avoided the kinds of monetary interventions that resulted in long-term inefficiencies.

However today, successful Japanese companies do not have to rely on their domestic economy. Instead, they can choose to sell their products abroad, in burgeoning markets, or raise capital abroad, where terms may be more conducive to them. The competitive nature of Japan's masculine culture where, "citizen's seem convinced that it is better to use the 'exit' option – that is, to try to improve their own lot individually – than to try to change government policy through political mobilization" (Schoppa, 78).

While much of the United States' and Japan's symptoms appear the same, the causes underlying them are quite different. For example, both countries also have low interest rates. However, the United States' low Treasury bill rate was brought about by the Federal Reserve Bank issuing quantitative easing into the market to stimulate domestic demand. . Japanese banks' sustain Japan's low interest rate by continuing to extend new loans to bad, debt-burdened companies. The U.S. government has been successful at keeping inflation at 2%; meanwhile, Japan is undergoing deflation, making it even more difficult for the government to whittle away their debt[18].

This case study demonstrates the importance of culture on credit worthiness. The comparison of the United States and Japan shows that even if two countries face similar situations, the way that the citizens and government react is different and strongly influenced by culture. The difference between a company and a country is that countries cannot be solely concerned with shareholder value and producing profit. Instead, a government must act in favor of its people, and often time, this is at the expense of the government's welfare. Therefore, it

[18] Mizunuma, Tetsuo. "Is the U.S. Following in Japan's Footsteps?" *Rady Business Journal: A Publication of the Rady School of Management* 2.1 (2009): 12-15. Web.

may be more important to account for the cultural factors within a country, than solely its economic factors to gauge its ability to service debt.

IX. HYPOTHESIS AND FINDINGS

My hypothesis is that culture will play a role in the credit rating and the bond yields of the countries. My thesis will be carried out in two folds.

Null Hypothesis I: There is no relationship between culture and sovereign credit ratings

Null Hypothesis II: There is no relationship between culture and bond yields

First, it is important to establish whether investor confidence and credit rating agencies have similar beliefs regarding sovereign credit. As shown in Table 1 above, S&P credit and bond yields are highly correlated. I also regressed the two variables to further analyze the relationship. The following linear regression model is used:

$$Y = b + aX + \varepsilon$$

Where,

Dependent variable Y = Bond Yield

Explanatory variable X = S&P Credit Ratings

Intercept '*a*' = basic difference in confidence and perception of risk by the two parties

Slope '*b*' = responsiveness of GGR Bond Yield to S&P Ratings

ε = Random error term

Regression Table 1: Bond Yield versus S&P credit

Regression Equation: Bond Yield = 0.270 + 1.12 S&P Credit				
Predictor	Coef	SE Coef	T	P
Constant	0.2699	0.4601	0.59	0.562
S&P Credit	1.125	0.1691	6.65	0.00
S=1.32289	R-Sq = 59.6%		R-Sq(adj) = 58.3%	
Analysis of Variance				
Source	DF	SS	MS	F	P
Regression	1	77.479	77.479	44.27	0.000
Residual Error	30	52.502	1.75		
Total	31	129.98			

The R-squared value of 59.6% signals that almost 60% of variance in the bond yields can be explained by the S&P credit. The model is also statistically significant. This demonstrates that there is a strong relationship between the two; however, credit ratings cannot explain all the variability in bond yields. I seek to find if this difference can be explained by cultural variables, and if cultural factors impact bond yields and credit ratings.

Economic Variables

In order to gain a clear understanding of culture's role in investor confidence, I first looked into the relationship between bond yields, S&P ratings and the economic factors S&P utilizes. These variables are: Per Capita income, inflation, fiscal balance, external balance, external debt, real GDP growth and Default History. These figures are shown in Table 2. In order to quantify Default History, I utilized dummy variables: countries that have had a history with default or bankruptcy are given 1, and 0 dictates no history of default. Unfortunately, it was difficult to quantify economic development, so I did not account for it in my analysis.

Table 2: Economic indicators utilized by Credit Rating Agencies to determine ratings

Countries	Per Capita Income (billions)	Inflation (%)	Fiscal Balance (billions)	External Balance (billions)	External Debt (billions)	Real GDP Growth (%)	Default History
Australia	42.4	2.10	-48.60	-30.70	1466.00	3.30	0
Austria	42.5	2.30	-14.00	12.00	883.50	0.60	1
Bangladesh	2	8.80	-4.50	-0.37	36.21	6.10	1
Belgium	38.1	2.40	-21.60	4.70	1399.00	0.00	0
Brazil	12	5.50	77.30	-63.47	405.30	1.30	1
Bulgaria	14.2	2.40	-1.10	0.28	43.24	1.00	1
Canada	41.5	1.80	-87.60	-52.60	1181.00	1.90	1
Chile	18.4	2.80	3.70	-1.10	102.10	5.00	1
China	9.1	3.10	-83.00	170.80	710.70	7.80	0
Colombia	10.7	3.20	-7.90	-7.33	73.41	4.30	1
Costa Rica	12.6	4.50	-2.30	-1.97	12.04	4.80	1
Croatia	18.1	2.90	3.80	-2.40	64.25	-1.10	0
Czech Republic	27.2	3.30	-7.96	-6.29	90.18	-1.00	0
Egypt	6.6	8.50	-23.00	-8.07	34.88	2.00	1
El Salvador	7.7	2.40	-0.90	-1.29	12.84	1.50	1

Finland	36.5	3.00	-1.40	-1.39	577.70	0.30	0
France	35.5	2.30	-149.00	-71.88	5633.00	0.10	1
Germany	39.1	2.20	-37.00	208.10	5624.00	0.70	1
Ghana	3.3	9.10	-1.60	-1.44	11.23	8.20	1
Greece	25.1	1.10	-29.10	-28.40	583.30	-5.70	1
Guatemala	5.2	4.00	-1.40	-2.71	16.17	3.10	1
Hong Kong	50.7	3.70	8.50	12.91	903.20	1.80	0
Hungary	19.8	5.60	5.80	1.50	170.00	-1.70	1
India	3.9	6.00	-109.50	-62.96	299.20	4.47	1
Indonesia	5	4.50	-9.90	5.70	187.10	6.00	1
Ireland	41.7	1.30	-22.00	1.40	2352.00	0.70	1
Israel	32.2	2.10	-8.10	0.87	104.20	2.90	0
Italy	30.1	3.00	-86.90	-74.30	2460.00	-2.30	0
Jamaica	9.1	6.80	-0.90	-2.37	14.60	0.90	1
Japan	36.2	0.10	-524.00	119.10	2719.00	2.20	1
Kuwait	43.8	3.20	60.00	70.78	28.21	6.30	0
Lebanon	15.9	5.50	-2.40	-11.78	32.64	2.00	0
Luxembourg	80.7	2.60	-0.50	11.60	2146.00	0.20	0
Malaysia	16.9	1.90	-14.00	32.99	95.55	4.40	0
Malta	26.1	2.50	1.20	-0.35	48.79	1.20	0
Mexico	15.3	4.10	-29.00	-11.27	217.70	3.80	1
Morroco	5.3	1.40	-5.70	-8.04	29.42	2.90	1
Netherlands	42.3	2.40	-39.10	70.92	2655.49	-0.50	0
New Zealand	28.8	1.20	-13.80	-5.10	90.23	2.20	0
Nigeria	2.7	12.10	-8.00	12.01	10.10	7.10	1
Norway	55.3	0.60	71.00	70.00	644.50	3.10	0
Pakistan	2.9	11.30	-13.90	0.27	55.98	3.70	0
Panama	15	6.10	-0.70	-3.87	13.13	8.50	1
Peru	10.7	3.60	3.20	-2.27	38.91	6.00	1
Philippines	4.3	3.40	-4.60	7.04	68.39	4.80	1
Poland	21	3.60	-8.40	-29.96	310.20	2.40	1
Portugal	23	2.90	-9.40	-20.40	548.80	-3.00	1
Romania	12.8	3.00	-7.80	-6.35	125.90	0.90	0
Russia	17.7	5.30	6.60	100.30	455.20	3.60	1
Serbia	10.5	6.20	-2.00	-3.23	32.60	-0.50	0
Singapore	60.9	4.40	3.30	56.98	24.64	2.10	0
Slovakia	24.3	3.60	-5.30	-2.90	72.94	2.60	0
Slovenia	28.6	2.50	-2.20	-0.76	61.23	-2.20	0
South Africa	11.3	5.20	-15.50	-16.67	47.56	2.60	1
South Korea	32.4	2.20	25.90	26.51	413.44	2.70	0
Spain	30.4	2.50	-126.90	-60.90	2290.00	-1.50	1
Sweden	41.7	1.40	0.50	38.29	1016.00	1.20	0
Switzerland	54.6	-0.90	3.40	74.06	1346.00	0.80	0
Taiwan	38.5	2.30	-15.40	40.91	127.40	1.30	0
Thailand	10	3.10	-4.10	11.90	115.60	5.60	0
Trinidad	20.4	8.70	-0.80	5.80	4.78	0.70	1
Turkey	15	6.16	-10.40	-48.90	331.40	3.00	1
UK	36.7	2.80	-201.50	-66.60	9836.00	0.20	1

US	49.8	2.00	-901.00	-473.90	16734.34	2.20	0
Uruguay	15.8	7.80	-0.40	-1.08	11.61	3.50	1
Venezuela	13.2	20.90	-15.40	27.20	63.74	5.70	1
Vietnam	3.5	9.20	-2.90	-4.74	41.85	5.10	1
Zambia	1.7	6.50	-0.80	-0.04	5.45	6.50	1

This Table shows the different economic indicators utilized by rating companies in order to come to a valuation of sovereign credit. Default history has been replaced by a dummy variable – in which 1 denotes having gone through bankruptcy and restructuring, while 0 represents none. Economic development variable is not used. Per capita income, fiscal balance, external debt, external balance were logged during the regression to make the data more manageable.
Source: CIA World Fact Book, Hofstede

I ran a multi-variable regression of the countries' economic indicators against its bond yield and S&P credit using the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

where,

Dependent variable Y = S&P ratings (or Bond Yields)

Explanatory Variable X_1 = Log(Per Capita Income)

Explanatory Variable X_2 = Inflation

Explanatory Variable X_3 = Log(Fiscal Balance)

Explanatory Variable X_4 = Log(External Balance)

Explanatory Variable X_5 = Log(External Debt)

Explanatory Variable X_6 = Real GDP Growth

Explanatory Variable X_7 = Default History

And ε represents random error term.

The results of the regression are shown below.

Regression Table 2: Bond Yield against Economic Indicators

Regression Equation: Bond Yield = 9.64 - 4.54 Per Capita Income + 0.623 Inflation + 1.15 Fiscal Balance - 0.527 External Balance - 0.374 External Debt - 0.595 Real GDP Growth - 0.952 Default History

Predictor	Coef	SE Coef	T	P	
Constant	9.6380	1.8420	5.23	0.000	
Per Capita Income	-4.5390	1.1550	-3.93	0.000	
Inflation	0.6226	0.1037	6.00	0.000	
Fiscal Balance	1.1462	0.5810	1.97	0.053	
External Balance	-0.5272	0.5124	-1.03	0.526	
External Debt	-0.3736	0.5855	-0.64	0.526	
Real GDP Growth	-0.5955	0.1212	-4.91	0.000	
Default History	-0.9516	0.6204	-1.53	0.130	
S = 2.2147		R-Sq = 65.7%		R-Sq(adj) = 61.7%	

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	7	563.551	80.507	16.42	0.000
Residual Error	60	294.153	4.903		
Total	67	857.704			

Regression Table 3: S&P Ratings against economic indicators

Regression Equation: S&P credit = 8.92 - 3.30 Per Capita Income + 0.128 Inflation + 0.164 Fiscal Balance - 0.130 External Balance - 0.555 External Debt - 0.277 Real GDP Growth + 0.230 Default History

Predictor	Coef	SE Coef	T	P	
Constant	8.9245	0.8629	10.34	0.000	
Per Capita Income	-3.3014	0.5409	-6.10	0.000	
Inflation	0.1282	0.0486	2.64	0.011	
Fiscal Balance	0.1635	0.2722	0.60	0.550	
External Balance	-0.1297	0.2401	-0.54	0.591	
External Debt	-0.5546	0.2743	-2.02	0.048	
Real GDP Growth	-0.2770	0.0568	-4.88	0.000	
Default History	0.2303	0.2907	0.79	0.431	
S = 1.03730		R-Sq =74.7%		R-Sq(adj) = 71.8%	

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	7	190.661	27.237	25.31	0.000
Residual Error	60	64.54	1.076		
Total	67	255.221			

As indicated in Regression Tables 2 and 3, economic variables are statistically significant in predicting both bond yields and credit ratings. Most of the variables seem to influence the dependent variables, however, external balance and external debt did not play a role in predicting bond yield results. External balance is determined by a country's current account, the money a

country brings in from export net money spent on imports. Credit rating agencies dictate that credit worthy nations tend to have a positive ratio (money spent is less than money brought in), however, this is not always true. For example, the United States spends a massive amount on imports ($473.50 billion more on exports than imports), while China's economy is heavily dependent on exports ($170.8 billion). Yet, the United States boosts a credit rating of AA+ while China has an AA-. Therefore, this variable does not impact credit ratings much since it is not as clearly indicative of a country's propensity to pay back debt.

External debt is not a statistically significant variable either. This is in line with the previous mentioned notion that Debt to GDP ratios has very little influence on S&P Rating. Similarly, countries with large amounts of debt, such as the United States and Japan, still have very high credit rating, AA+ and AA- respectively, especially relative to their less developed peers such as Slovenia, which has less debt but only an A- rating.

Default History also does not seem to play a role in predicting both bond yields and S&P credit ratings. This may be due in part to the fact that I utilized dummy variables. Many countries categorized as having "default history" are quite secure. For example, Germany has an AAA rating; however, since it went into default in 1932, 1939, and 1948, I still marked it as "default history."

Fiscal Balance does not influence S&P ratings; however, it is statistically significant in predicting bond yields. Fiscal Balance calculates difference between expenditures and revenues in a country. While intuitively, countries that spend more on expenditures should have lower credit ratings, credit rating agencies considers the fact that some countries have high financing needs due to focuses on value investments to sustain economic growth. Therefore, this variable is a lot more subjective and S&P may have a higher understanding of a country's decisions.

Meanwhile, investors may have a more straightforward perspective – that countries that spend more are less likely to service debt. Hence, explaining the discrepancies in results.

Cultural Dimensions

Next, I ran multi-variable regressions of the countries' cultural dimensions, using Hofstede's index, against its general bond yield and S&P credit. I used two different samples to carry out my thesis. Due to the constrained nature of research on culture, I was limited to countries that have been analyzed by Hofstede. My first regressions included the fifth dimension of Long Term Orientation with a smaller sample (since Hofstede provides less information about this). My second regression focuses solely on the original four dimensions; however, the dataset is much larger (67).

For my first regression, I only used countries with bonds that are highly liquid and priced "fairly." The bond yields depicts their ten-year bond yields. In addition, all of these countries have been rated on all five of Hofstede's dimensions. I quantified the countries' S&P credit (AAA = 1, AA+ = 2…etc.). All numbers on Hofstede's index were logged in order to make the data more manageable.

Table 3: Hofstede's Five Dimensions & Liquid Government Bonds

Countries	Bond Yield	S&P credit	Log(PDI)	Log(INDV)	Log(MAS)	Log(UAI)	Log(LTO)
Australia	3.249	1	1.56	1.95	1.79	1.71	1.49
Austria	1.58	2	1.04	1.74	1.90	1.85	1.49
Belgium	2.203	2	1.81	1.88	1.73	1.97	1.58
Brazil	9.062	4	1.84	1.58	1.69	1.88	1.81
Canada	1.774	1	1.59	1.90	1.60	1.68	1.36
China	3.5	2	1.90	1.30	1.82	1.48	2.07
Czech Republic	1.886	2	1.76	1.76	1.45	1.87	1.11
Denmark	1.448	1	1.26	1.87	1.20	1.36	1.66
Finland	1.467	1	1.52	1.80	1.81	1.77	1.61
France	1.798	2	1.83	1.85	1.32	1.93	1.59
Germany	1.26	1	1.54	1.83	1.60	1.81	1.49
Hong Kong	1.013	1	1.83	1.40	1.76	1.46	1.98

Hungary	5.8	5	1.66	1.90	1.94	1.91	1.70
India	7.883	4	1.89	1.68	1.61	1.60	1.79
Ireland	3.959	4	1.45	1.85	1.65	1.54	1.63
Italy	4.352	4	1.70	1.88	1.60	1.88	1.53
Japan	0.554	2	1.73	1.66	1.48	1.96	1.90
Netherlands	1.698	1	1.58	1.90	1.81	1.72	1.64
New Zealand	3.413	2	1.34	1.90	1.76	1.69	1.48
Norway	2.121	1	1.49	1.84	0.90	1.70	1.64
Philippines	3.4354	5	1.97	1.51	1.76	1.64	1.28
Poland	3.593	3	1.83	1.78	1.57	1.97	1.51
Portugal	6.453	5	1.80	1.43	1.49	2.02	1.48
Singapore	1.4	1	1.87	1.30	1.68	0.90	1.68
Slovakia	2.855	3	2.02	1.72	2.04	1.71	1.58
Spain	4.721	4	1.76	1.71	1.63	1.93	1.28
Sweden	1.672	1	1.49	1.85	0.70	1.46	1.30
Switzerland	0.668	1	1.53	1.83	1.85	1.76	1.60
Taiwan	1.266	2	1.76	1.23	1.67	1.84	1.94
Thailand	3.442	4	1.81	1.30	1.83	1.81	1.75
UK	1.738	1	1.54	1.95	1.82	1.54	1.40
US	1.7477	2	1.60	1.96	1.60	1.66	1.46

PDI refers to Power Distance Index, the higher a country scores, the larger the propensity of individuals to respect authority and hierarchy. INDV refers to Individualism Index. It measures how much a culture values the group over the individuals. The higher a country scores, the citizens are typically more independent. MAS refines to the Masculinity Index, a country with a high score in this area is typically more competitive and adheres closely to gender roles. UAI stands for Uncertainty Avoidance Index; a country that puts emphasis on eliminating uncertainties in its environment typically scores higher on this index. LTO refers to the Long-Term Orientation of a culture. A culture that scores high in this area tends to puts a lot of emphasis on the future, and takes on a long-term perspective when taking action.

Source: Hofstede, Bloomberg, S&P Credit

However, if we run a multi-variable regression of Hofstede's five dimensions against

S&P credit, and then bond yields, we can see that both models are not statistically significant.

My regressions utilized the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

where,

Dependent variable Y = S&P ratings (or Bond Yields)

Explanatory Variable X_1 = Log(Power Distance Index)

Explanatory Variable X_2 = Log(Individualism Index)

Explanatory Variable X_3 = Log(Masculinity Index)

Explanatory Variable X_4 = Log(Uncertainty Avoidance Index)

Explanatory Variable X_5 = Log(Long-Term Orientation Index)

And ε represents random error term.

The results of the regression are as follows.

Regression Table 4: (32- Sample Set) Regression Analysis of Bond Yield against Hofstede's Five Dimensions

Regression Equation: GGR Bond Yield = - 6.80 + 2.87 PDI + 0.18 INDV + 0.36 MAS + 1.98 UAI + 0.40 LTO

Predictor	Coef	SE Coef	T	P	
Constant	-6.8	8.074	-0.84	0.407	
PDI	2.872	2.066	1.39	0.176	
INDV	0.176	2.305	0.08	0.94	
MAS	0.358	1.378	0.26	0.797	
UAI	1.979	1.712	1.16	0.258	
LTO	0.399	2.031	0.2	0.846	
S = 2.04982		R-Sq = 16.0%		R-Sq(adj) = 0.0%	
Analysis of Variance					
Source	DF	SS	MS	F	P
Regression	5	20.734	4.147	0.99	0.445
Residual Error	26	109.246	4.202		
Total	31	129.98			

Regression Table 5: (32 Sample-Set) Regression Analysis of S&P ratings against Hofstede's Five Dimensions

Regression Equation: S&P Credit= -0.85 + 1.76 PDI - 1.66 INDV + 0.691 MAS + 2.35 UAI - 1.29 LTO

Predictor	Coef	SE Coef	T	P	
Constant	-0.846	4.826	-0.18	0.862	
PDI	1.757	1.235	1.42	0.167	
INDV	-1.664	1.378	-1.21	0.238	
MAS	0.6911	0.8237	0.84	0.409	
UAI	**2.352**	**1.024**	**2.3**	**0.03**	
LTO	-1.286	1.214	-1.06	0.299	
S = 1.22524		R-Sq = 36.2%		R-Sq(adj) = 24%	
Analysis of Variance					
Source	DF	SS	MS	F	P
Regression	5	22.187	4.437	2.96	0.030
Residual Error	26	39.032	1.501		
Total	31	61.219			

The bond yield regression yielded an R-square value of 16% and a p-value of 0.445. None of dimensions are significant at any level as well. S&P credit is slightly better, with R-squared at a level of 36.2% and a P-value of 0.03, which signifies a statistically significant model at a p<0.05 level (Regression Table 5). Furthermore, the Uncertainty Avoidance Index is a statistically significant variable at p = 0.030 (albeit the only one). This implies that credit ratings are related to the cultural dimension of Uncertainty Avoidance Index. However, the R-square is so low that it is difficult to refute with confidence *null hypothesis I:* there is no relationship between culture and rating agencies.

At the same time, this data result need to be taken with a grain of salt. The sample size is very small (32) due mainly in part to the parameters explained above. Although Hofstede surveyed 96 countries, few overlapped with frequently traded government bonds. Furthermore, most government bonds that are highly liquid come from countries that are more highly regarded. Regardless of its culture, the countries have become successful. Investors may be more optimistic about the sovereign's ability to service its debt, hence making the financial instruments more attractive on the market. Therefore, it does not accurately reflect cultural influences.

The statistically significant relationship between the Uncertainty Avoidance Index and S&P may be related to the cultural dimension's manifestation into the country's financial status. The positive coefficient 2.352 suggests that as a country ranks higher on uncertainty avoidance index, the more likely its S&P credit rating will increase as well (Regression Table 5). This may be because countries with higher uncertainty avoidance make an effort to try to understand more of their environment and make educated decisions. These countries may be very methodical in their decision making process and suggests more thoroughly deliberated monetary process. Since

political landscape is an important component of the qualitative assessments employed by credit rating agencies, this dimension may manifest in ratings. However, since the sample size is so small, it is hard to draw very confident conclusions. Most of my explanations are assumptions.

In order to gain a greater understanding, I increased my sample size of countries to 67. However, I was unable to include long-term orientation as a variable due to limited research. Table 4 lists the countries, in addition to the above 32, that I added to my sample size.

Table 4: Hofstede's Five Dimensions & Available all ranked Government Bonds

Countries	Bond Yield	S&P Credit	Log(PDI)	Log(INDV)	Log(MAS)	Log(UAI)
Bangladesh	9.54	6	1.903	1.301	1.74	1.778
Bulgaria	3.068	4	1.845	1.477	1.602	1.929
Chile	3.086	2	1.799	1.362	1.447	1.934
Colombia	2.72	4	1.826	1.114	1.806	1.903
Costa Rica	4.009	5	1.544	1.176	1.322	1.934
Croatia	4.65	5	1.863	1.519	1.602	1.903
Egypt	16.097	7	1.845	1.398	1.653	1.903
El Salvador	4.83	6	1.82	1.279	1.602	1.973
Ghana	4.5	7	1.903	1.176	1.602	1.813
Greece	11.342	7	1.778	1.544	1.756	2.049
Guatemala	4.056	5	1.978	0.778	1.568	2.004
Indonesia	5.596	5	1.892	1.146	1.663	1.681
Israel	2.841	3	1.114	1.732	1.672	1.908
Jamaica	5.474	8	1.653	1.591	1.833	1.114
Kuwait	2.752	2	1.954	1.398	1.602	1.903
Lebanon	5.878	7	1.875	1.602	1.813	1.699
Luxembourg	1.43	1	1.602	1.778	1.699	1.845
Malaysia	3.38	3	2.017	1.415	1.699	1.556
Malta	4.346	4	1.748	1.771	1.672	1.982
Mexico	2.506	4	1.908	1.477	1.839	1.914
Morroco	4.158	4	1.845	1.398	1.724	1.833
Nigeria	3.949	6	1.903	1.477	1.778	1.74
Pakistan	11.99	7	1.74	1.146	1.699	1.845
Panama	3.649	4	1.978	1.041	1.643	1.934
Peru	1.045	4	1.806	1.204	1.623	1.94
Romania	5.501	5	1.954	1.477	1.623	1.954
Russia	2.914	4	1.968	1.591	1.556	1.978
Serbia	14.72	6	1.934	1.398	1.633	1.964
Slovenia	5.873	3	1.851	1.431	1.279	1.944
South Africa	3.148	4	1.69	1.813	1.799	1.69

South Korea	2.77	3	1.778	1.255	1.591	1.929
Trinidad	5.952	3	1.672	1.204	1.763	1.74
Turkey	6.72	5	1.82	1.568	1.653	1.929
Uruguay	2.138	4	1.785	1.556	1.58	2
Venezuela	16.32	6	1.708	1.079	1.863	1.881
Vietnam	8.894	6	1.845	1.301	1.602	1.477
Zambia	12.923	7	1.778	1.544	1.602	1.699

Table 4 lists the additional countries added to the original sample size in Table 3. Again, PDI refers to Power Distance Index, the higher a country scores, the larger the propensity of individuals to respect authority and hierarchy. INDV refers to Individualism Index. It measures how much a culture values the group over the individuals. The higher a country scores, the citizens are typically more independent. MAS refines to the Masculinity Index, a country with a high score in this area is typically more competitive and adheres closely to gender roles. UAI stands for Uncertainty Avoidance Index; a country that puts emphasis on eliminating uncertainties in its environment typically scores higher on this index.
Source: S&P credit, Bloomberg, Hofstede

I utilized all the countries that Hofstede collected data on the 4 dimensions. However, many of these countries have illiquid government bonds. Therefore, the prices may not accurately reflect investor confidence. In addition, some of the countries do not offer 10-year bonds. In those cases, I used Bloomberg to find the next closest long-term bond yields. In addition, if the countries do not have generic 10 year bond yields, I utilized their foreign currency denominated bonds. This is because, as we can see in Japan, domestic investors may be bias towards their government. Moreover, countries can often manipulate inflation in order to change the debt payments. Therefore, foreign currencies denominated bonds are more representative of the government default possibility.

The results of this analysis were particularly interesting. The increase in sample size significantly improved the results of my analysis. The models seemed to be statistically significant at $p < 0.05$ level when the cultural dimensions were regressed against both bond yields and S&P credit.

Regression Table 6: (67 Sample-set) Regression Analysis of Bond Yield against Hofstede's Five Dimensions

Regression Equation: Bond Yield = 2.78 + 1.71 UAI + 1.41 MAS - 3.89 INDV + 1.28 PDI				

Predictor	Coef	SE Coef	T	P
Constant	2.770	7.686	0.36	0.719
UAI	1.711	2.058	0.83	0.409
MAS	1.409	1.958	0.720	0.475
INDV	-3.894	1.787	-2.180	0.033
PDI	1.285	2.577	0.500	0.620

S = 3.42288	R-Sq = 13.9%		R-Sq(adj) = 8.5%	

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	119.59	29.9	2.55	0.048
Residual Error	63	738.12	11.72		
Total	67	857.7			

Regression Table 7: (67 Sample Set) Regression Analysis of S&P against Hofstede's Five Dimensions

Regression Equation: S&P Credit= 0.70 + 1.02 UAI + 1.50 MAS - 2.73 INDV + 1.62 PDI				

Predictor	Coef	SE Coef	T	P
Constant	0.702	3.815	0.18	0.855
UAI	1.021	1.021	1.00	0.321
MAS	1.496	0.972	1.540	0.129
INDV	-2.726	0.887	-3.070	0.003
PDI	1.622	1.279	1.270	0.210

S = 1.69903	R-Sq = 28.7%		R-Sq(adj) = 24.2%	

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	73.358	18.34	6.35	0.000
Residual Error	63	181.862	2.887		
Total	67	255.221			

The models are statistically significant at a $p<0.05$ level for both bond yields and S&P credit rating. Although both models are statistically significant, most predictor variables are not statistically significant; furthermore the R-squared values were very low. Strangely enough, the dimension of individualism was the most influential factor for both Bond Yields and S&P Ratings. This is different from the result of the previous regression (Regression Table 4), where the Uncertainty Avoidance Index is the most influential. Due to the contradictions in the two

conclusions, in order to draw a more conclusive opinion, I eliminated the other predictor variables and solely regressed Individualism against S&P and bond yield. The results are shown below:

Regression Table 8: Regression Analysis of Hofstede's Individualism Dimension against Bond Yield and S&P Rating

Regression Equation: Bond Yield = 11.3 - 4.45 INDV				
Predictor	Coef	SE Coef	T	P
Constant	11.286	2.346	4.81	0.000
S&P Credit	-4.447	1.5	-2.96	0.004
S=3.38658		R-Sq = 11.7%		R-Sq(adj) = 10.4%

Regression Equation: S&P Rating = 8.80 - 3.34 INDV				
Predictor	Coef	SE Coef	T	P
Constant	8.803	1.201	7.33	0.000
INDV	-3.3397	0.768	-4.35	0.000
S= 1.73372		R-Sq = 22.3%		R-Sq(adj) = 21.1%

Although individualism does yield a statistically significant model for both bond yields and for S&P ratings, the regressions have very low R-square scores. Therefore, we cannot draw any conclusive results about the variable "Individualism" either.

Cultural Dimensions and Economic Indicators

In order to further understand the potential impact of culture on S&P ratings and investor confidence, it is also important to see the dimensions in action with the other variables utilized by credit rating agencies. Using the same multi-variable equation from above, I regressed economic indicators and cultural variables against bond yields and S&P ratings. The results of my regression are shown below:

Regression Table 9: Regression Analysis of Hofstede's Individualism Dimension and economic indicators against S&P Credit Ratings

Regression Equation: S&P credit = 7.14 - 3.28 Per Capita Income + 0.122 Inflation + 0.056 Fiscal Balance - 0.091 External Balance - 0.443 External Debt - 0.272 Real GDP Growth + 0.127 Default History + 0.078 Power Distance - 0.426 Individualism + 0.635 Masculinity + 0.614 Uncertainty Avoidance

Predictor	Coef	SE Coef	T	P	
Constant	7.1440	2.8290	2.53	0.014	
Per Capita Income	-3.2770	0.6045	-5.42	0.000	
Inflation	0.1221	0.0503	2.43	0.018	
Fiscal Balance	0.0564	0.2958	0.19	0.849	
External Balance	-0.0908	0.2742	-0.33	0.742	
External Debt	-0.4425	0.3028	-1.46	0.149	
Real GDP Growth	-0.2721	0.0603	-4.51	0.000	
Default History	0.1274	0.3116	0.41	0.684	
Power Distance	0.0777	0.8907	0.09	0.931	
Individualism	-0.4265	0.7156	-0.60	0.554	
Masculinity	0.6353	0.6601	0.96	0.340	
Uncertainty Avoidance	0.6145	0.6994	0.88	0.383	
S = 1.05215		R-Sq =75.7%		R-Sq(adj) = 70.9%	

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	193.288	17.566	15.87	0.000
Residual Error	56	61.993	1.107		
Total	67	255.221			

Regression Table 10: Regression Analysis of Hofstede's Individualism Dimension and economic indicators against Bond Yields

Regression Equation: Bond Yield = 13.4 - 4.58 Per Capita Income + 0.627 Inflation + 1.29 Fiscal Balance - 0.518 External Balance - 0.209 External Debt - 0.620 Real GDP Growth - 1.01 Default History - 0.82 Power Distance - 1.59 Individualism - 1.21 Masculinity + 0.95 Uncertainty Avoidance

Predictor	Coef	SE Coef	T	P	
Constant	13.4440	6.0040	2.24	0.029	
Per Capita Income	-4.5770	1.2830	-3.57	0.001	
Inflation	0.6267	0.1067	5.87	0.000	
Fiscal Balance	1.2905	0.6279	2.06	0.045	
External Balance	-0.5181	0.5821	-0.89	0.377	
External Debt	-0.2091	0.6428	-0.33	0.746	
Real GDP Growth	-0.6199	0.1280	-4.84	0.000	
Default History	-1.0081	0.6614	-1.52	0.133	
Power Distance	-0.8160	1.8910	-0.43	0.668	
Individualism	-1.5940	1.5190	-1.05	0.299	
Masculinity	-1.2120	1.4010	-0.86	0.391	
Uncertainty Avoidance	0.9490	1.4850	0.64	0.525	
S = 2.23323		R-Sq = 67.4%		R-Sq(adj) = 61.0%	

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	578.414	52.583	10.54	0.000
Residual Error	56	279.290	4.987		
Total	67	857.704			

After inputting economic indicators into the model, cultural dimensions immediately lost its effect. The models are statistically significant, however, none of the cultural dimensions are statistically significant. This means that cultural dimensions do *not* affect S&P credit ratings and bond yields. Avoidance and Individualism might have been statistically significant in Regression Tables 6 and 7 due to their correlation with certain economic factors that *does* influence credit ratings and bond yields.

Table 5: Correlation Matrix of Economic indicators used by S&P Ratings and Hofstede's Cultural Dimensions

	S&P Rating	Per Capita Income	Inflation	Fiscal Balance	External Balance	External Debt	Real GDP Growth	Default History	Bond Yield	PDI	INDV	MAS	UAI
S&P Rating	1												
Per Capita Income	-0.776	1											
Inflation	0.571	-0.508	1										
Fiscal Balance	0.182	-0.214	0.167	1									
External Balance	-0.104	-0.003	-0.010	0.600	1								
External Debt	-0.347	0.403	-0.232	-0.822	-0.580	1							
Real GDP Growth	0.167	-0.421	0.404	0.071	0.139	-0.197	1						
Default History	0.402	-0.479	0.313	0.011	-0.030	-0.054	0.186	1					
Bond Yield	0.719	-0.534	0.650	0.156	-0.079	-0.249	0.038	0.210	1				
PDI	0.386	-0.498	0.255	0.115	0.039	-0.252	0.282	0.115	0.242	1			
INDV	-0.472	0.544	-0.444	-0.282	-0.194	0.441	-0.489	-0.226	-0.343	-0.517	1		
MAS	0.161	-0.123	0.156	-0.222	-0.112	0.112	0.019	0.210	0.076	0.098	0.046	1	
UAI	0.163	-0.191	-0.033	0.048	-0.040	-0.108	-0.158	0.169	0.137	0.102	-0.112	-0.021	1

Table 5 shows the correlation between all variables used in regressions for Regression Tables 9 and 10. PDI stands for Power Distance, INDV stands for Individualism, MAS refers to masculinity and UAI refers to the Uncertainty Avoidance Index.

Power Distance Index (PDI) is correlated with per-capita income, a statistically significant variable. Furthermore, individualism is correlated with inflation, per capita income, external debt, and real GDP growth. These correlations may be manifest themselves when regressions were run independently with cultural dimensions and bond yields or S&P ratings. However, by exploring the relationships among economic factors, bond yields, S&P ratings, it is clear that cultural dimensions do affect investor confidence. In the end, economic indicators are still more relevant in investor confidence.

XI. CONCLUSION

Culture shapes the way that people live their lives. It is the set of rules that underlies people's decisions and actions. While intuitively, a country's culture should motivate investors' confidence, the empirical evidence suggests otherwise. Cultural dimensions do not affect a country's sovereign credit risk perception. In the end, economic indicators are still much more predictive of both investors' sentiments and credit ratings. At the same time, cultural factors are correlated with certain economic variables, such as per capita income or relative wealth (Ramin, Firoz and Kwarteng (2010). Therefore, it is possible that a country's culture may manifest itself into the economic factor; hence, culture may already be accounted for in risk calculations.

There have been multiple limitations to my research. Most notably, culture is a very complex idea. In the process of simplifying the concept into quantifiable data, many nuances may be lost. Furthermore, my thesis solely focused on Hofstede's cultural dimensions. The data obtained by Hofstede may be outdated and does not accurately reflect the cultures today. In order to improve my research, it may be a good idea to use more recent data, such as World Values Survey. Furthermore, the analysis could be expanded by looking into how accurately credit rating agencies predict default rates, and compare it to how accurately culture predict default rates. After all, both investor sentiments and credit rating agencies are trying to gauge a nation's default ability. While they may not be taking culture into account now, it will be an interesting question to ask whether they *should.*

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