The Cost of Culture
The Impact of National Culture on the Pass-Through of Commodity Shocks

The Honors Program
Senior Capstone Project
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April 2013

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ACKNOWLEDGEMENTS

I would like to take this opportunity to thank everyone that has helped me in the completion of this Senior Capstone Project. Without your support, the completion of this research would not have been possible. First off, I would like to thank Dr. Segovis and the Honors Program for giving me the opportunity to both perform and present this research. The completion of a capstone project has truly been a milestone in my academic career, and without the support of this program, I would not have had such an opportunity.

The help and tremendous support provided by my editorial reviewer, Dr. Madan Annavarjula, was essential in the completion of this project. Your help and feedback in the creation of the research presentation and this final manuscript has been invaluable.

In particular, I would like to thank my faculty advisor, Dr. Andrés Ramirez, for his tireless work to help me complete this capstone project. From writing code, to teaching me to work within SAS, and even helping me to develop this research concept, he has been instrumental in the completion of this final research project. For all of his contributions on this project, I am truly appreciative.

Finally, I would like to thank my friends and family for their continued support over the past year while I've worked from formation to completion of this Senior Capstone Project. Your words of encouragement throughout this journey have helped me to reach this milestone.

<u>ABSTRACT</u>

This study analyzes the impact of national culture on the pass-through of commodity price shocks to retail goods. In particular, this study explores the commodities of coffee, cotton and steel. Through the use of regression analysis, this study looks to determine the relationship between two key predictive variables: risk tolerance of a country and commodity shocks within a company's associated commodity market, and their impact on the value of companies within that country. Additional factors are explored at the firm financial level and the firm country level. The purpose of this study is to examine if consumers of one country will pay more overall for retail goods than consumers of another country, based on the culture of companies involved in the supply chain of that good. An analysis of firms in countries with varying levels of risk tolerance will indicate which countries absorb or pass more of the shock to consumers.

Findings indicate that national culture and commodity shocks do not have an overall influential effect on the price that consumers are paying across the commodity chains explored. Culture, in terms of the level of uncertainty avoidance in the country of incorporation, plays no significant role in the pass-through of commodity price shocks. While it was seen that culture does not have significant implications on commodity price shocks, it does begin to suggest that the recent globalization phenomenon has taken a formal standing in the way that businesses are performing internationally. Implications for global managers are found within the context of this research and its application henceforth in the field of international finance.

INTRODUCTION

As commodities on the open market experience both positive and negative shocks in price, the effects are often reflected in the price of final consumer goods containing a percentage of these commodities; this is the phenomenon known as pass-through. Cotton is a primary example of the volatility that commodities experience. Its price over the past five years has fluctuated from as low as $24.61 in February 2009, to a high of $104.26 in March of 2011, to its most recent price of $54.59 in April 2013 (Yahoo! Finance). When prices of this critical production input experience such volatility as this, how are consumers impacted at the retail level? Did suppliers absorb the price jump, or were consumers paying more for their retail goods? Previous financial literature suggests that the price increase is in fact transmitted out to the consumers at the final retail level, primarily when the commodity experiences a strong positive price shock, or price increase (Ramos and Veiga, 2011). At the same time, companies working within the supply chains of industries utilizing this commodity are less inclined to pass on a negative price shock to consumers, causing a decrease in retail prices (Richards and Pofhal, 2009).

It is the goal of this research to define the impact of risk tolerance on the pass-through of commodity price shocks to the retail level of consumer goods. The dimension of national culture that will be explored for its impact is Uncertainty Avoidance. This dimension is a proxy for risk tolerance within a country's culture, and was developed through the extensive research of Geert Hofstede on national culture. In his groundbreaking work, Hofstede interviewed individuals working within the international offices of IBM on their perceptions of national culture, through which he developed four cross-cultural dimensions for group and organizational culture: Uncertainty Avoidance, Power Distance, Masculinity vs. Femininity, and Individualism vs. Collectivism. Uncertainty Avoidance, our dimension of interest, is defined as the degree to which a nation is uncomfortable with uncertainty and ambiguity (Hofstede, 2001). This paper will explore the impact of a nation's risk tolerance on the pass-through of commodity shocks from companies within a supply chain to final consumer goods. It is expected that suppliers from those countries with higher uncertainty avoidance, and thus a lower tolerance for risk, will be more likely to pass on the shocks seen at the commodity level to retailers of final consumer goods. Conversely, suppliers from those countries with lower uncertainty avoidance, and thus a

higher tolerance for risk, will be less likely to pass on the shocks seen at the commodity level to retailers of final consumer goods.

These shocks will be measured on the commodities of coffee, cotton and steel. Coffee, cotton and steel were chosen as the commodities on which this research will focus as they are all goods closely followed by investors, and have varying levels of processing in becoming final consumer goods. Steel has the highest level of processing from production to final retail good, followed by cotton with a moderate level of processing, and then coffee with a low level of processing which results in a large percentage of the initial product being present in the final retail good. As these products are all major inputs for the products in which they appear, any fluctuations seen in the price of these commodities should be seen downstream in the pricing of their final goods. Prior research indicates that retail items with further processed inputs will show less response to related commodity price changes than will retail items with less processed inputs (Roeger and Leibtag, 2011). The change in market value of the companies selling the final consumer goods will indicate whether or not the price shocks have been passed-through.

This area of research is appealing as one may wonder if these cultural differences can apply to a "black and white" subject area such as finance. Given that price transmission has the ability to be supplemented by a certain level of negation between supplying and purchasing parties, it is imperative to know if the cultures of the two groups would impact the outcome of pass-through to retail prices.

There is a great deal of information available on the trade between nations. Finance literature has explored the depths of the concept of pass-through. Literature on international business has explained the concept of culture, and how national identity impacts day to day business interactions. However, there has been no such research that delves into both subject matters and investigates the impact of culture on pass-through. This research will be significant to the existing on the concept of pass-through, as there has yet to be work focused on the direct impact that culture has on the effects of pass-through. The findings in this research will be important to policy makers and managers of multinational companies so that they will reach an understanding of who suffers and who prospers the most from pass-through. It is important as any significant findings regarding culture's impact on the pass-through of price shocks could lead to information

for companies on how to best negotiate with their foreign suppliers, or how to potentially hedge themselves from this pass-through by picking suppliers whose cultures are closer to their own. If a link between culture and pass-through can be established, and then perceived aversion to risk does in fact impact the level of pass-through experienced in the country, discrepancies in the price of similar goods can be predicted across countries at the time of a commodity shock. This information would be valuable to many managers involved in the purchase and acquisition of goods internationally.

LITERATURE REVIEW

Commodity Shocks

The price volatility of the commodities market has historically proven to be a source of significant wealth accumulation and loss for investors betting directly on the expected future market values. While the shocks in the prices of these goods have a direct impact on investors following them in the market, these changes have a substantial impact on the global consumer in the way of how much they will pay for their everyday goods.

A significant body of work has been created in recent years involving the impact of commodity shocks across various countries with various economic structures and levels of development. In the work of Céspedes and Velasco (2012), the structural characteristics of an economy and its policy framework are identified as the primary drivers of macroeconomic responses to commodity booms and busts. The research finds evidence that both output and investment dynamics of a country are drastically impacted by commodity price shocks and those impacts are greater for larger economies with less developed financial markets (Céspedes and Velasco 2012). It was also identified that while commodity price shocks, or terms-of-trade shocks, are diffused into the economy through various routes, one significant factor that increases these effects is the presence of a rigid exchange rate regime. Moreover, the effects on overall economic output are magnified to a further extent when negative shocks are experienced than when positive shocks occur (Céspedes and Velasco 2012). The authors also found that the output response to commodity shocks goes up as financial development rises, and eventually goes down once financial development within the country has been realized. This information is important to consider as lesser developed nations being analyzed in our research may be prone to a more significant impact from commodity shocks than those nations that are further developed.

The work by Cashin et. al. (2000) gives a significant view of historical commodity price shocks from 1957-98, in terms of the length and severity of shocks. The authors find that shocks to commodity prices tend to last for longer periods of time, with the specific length of time being related to the commodity at hand. It is found that tree crops and metals have long-lasting shocks, while softwoods have shorter-lived shocks (Cashin et. al. 2000). This finding is important as it determines how international differences will be equalized during commodity exports or

subsidized by governments. The information provided in this research is significant to consider when looking into countries that rely heavily on commodity exports for the majority of their earnings. This paper also contends that developing countries are most severely affected by commodity price shocks. Much like the progress made in this paper, our work to identify national culture, particularly uncertainty avoidance, as a determinant of commodity shock price transmission would be significant to international bodies working to equalize commodity prices and reduce the typical subsidies implemented.

Pass-Through

The concept of pass-through can be explained as a situation in which the increase in the price of a commodity causes a direct increase or decrease on the price of final consumer goods. Previous work regarding pass-through focuses on the transfer of exchange rate fluctuations onto consumer goods prices. Nakumura and Zerom (2009) explain that pass-through is not always completely transferred, and that exchange rate pass-through into prices is delayed and incomplete. The concept of pass-through is an important area of study as it works to predict just how fluctuations in commodity prices will directly impact the prices of retail goods. Ramos and Veiga (2011), through their study of on the pass-through of oil price fluctuations to consumers, make a notable observation that oil price hikes impact industry returns more than oil price drops. This significant finding asserts that increases in the prices of the commodities will cause greater changes in the consumption of these commodities than would a decrease in their price.

In a new view of the pass-through effect, Besanko, Dranove and Shanley (2001) explore the concept of companies coping with cost advantages and disadvantages, and how that may impact their likelihood of passing on the effects of a positive or negative change in the associated commodity price. The authors explore the likelihood of a firm to pass on favorable cost changes in the form of lower prices to consumers, as well as the potential of firms to simply take the advantage and profit from increased margins. Conversely, the group looks at how unfavorable changes in cost are managed in terms of cost transfer to consumer goods. Competitive interactions of firms within their environment are a component of the authors' hypotheses, as they predict that oligopolies should have higher pass-through elasticities than firms in other market structures. This assumption is based on the use of constant-mark-up pricing to maintain a

fixed price cost margin. This work distinguishes between companies that are in commodity industries (homogenous products produced) and noncommodity industries (products produced are differentiated). The authors assume pass-through elasticity in the commodity industry to be at zero, while the pass-through elasticity of noncommodity industries will be positive as it is driven by price changes at the firm level and on the level of the competitor's prices. Concluding results show that firms within the noncommodity industry are more likely to pocket an incremental cost advantage rather than passing on the cost advantage to consumers through a reduced retail price. It is also found that firms within oligopoly markets do in fact maintain their strict profit margins through passing along any changes in commodity price to the retail price. Additionally, it was found that firms starting out with any initial cost advantage are more likely to change their retail prices in response to commodity price changes than a firm with an initial cost disadvantage. This research takes another look at pass-through from a unique perspective, observing that the competitive positioning of a firm does in fact impact their ability to absorb or pass on commodity price shocks to consumers.

A substantial amount of research has been done to investigate the pass-through phenomenon in respect to its impact on food prices. The high number of commodities commonly involved in food stuffs- wheat, corn, oats, milk, cocoa, sugar- as well as the high volume sold globally, lends this sector to the research area regarding the pass-through of commodity price shocks onto final consumer goods. In Roeger and Leibtag (2011), fluctuations in the retail prices of beef and bread in the United States are investigated in response to changes in ingredient and input costs. This work finds that a more processed item shows less response to price changes than a less processed item. Moreover, Liebtag (2008) asserts that when commodities are a small contributor to the production of the final consumer good, any shock in the price of the commodity will have little impact on the retail price of the good as its input is only a small contribution. These findings justify our selection of coffee, cotton, and oil, as each of these commodities contributes to final retail goods that are processed to varying degrees.

The impact of commodity prices and food inflation on the pass-through to retail food prices are examined by Richards and Pofhal (2009). The impact of a change in commodity price will be determined based upon the amount used as an input to the final retail product. Pass-through rates

should change as retailers and wholesalers face greater pressures from an inflationary environment. Through their comparison of price shifts in apples and ready to eat cereal, Richards and Pofhal find that when commodity prices are rising, the profit margins for wholesalers and retailers will fall. In an effort to preserve market share, retailers will be less likely to raise prices and absorb the increase in price, provided that suppliers also absorb some of the increase. Additionally, retailers will not readily lower their price when commodity costs are decreasing, as a way to make back previously lost margin. To some degree, retailers and wholesalers may exploit consumer expectations that prices should remain high following a shock in commodity price, and exercise pricing power. The authors also point out that retailers are faced with a much more competitive pricing environment than wholesalers, and therefore cannot pass-through price increases as readily to consumers.

The work of Leibtag (2009) contributes further to the determination of pass-through effects on retail food prices, but additionally notes the speed at which these changes can be seen on the retail price level. It is assumed in this analysis that the change in the retail price of food is primarily driven by commodity price changes, which also impacts prices on the farm and wholesale level. Corn, soybeans, and wheat are the primary focus in terms of traded commodities. Regression analyses show the impact of pass-through on the retail prices, as well as the time it takes for these impacts to be seen on the retail level. In examining the impact of these three commodities on the retail prices of beef, pork, poultry, eggs, milk and white bread, the most evident case of pass-through can be seen in the price of white bread which exhibits a pass-through of 14.1%. In all, price changes pass-through at the wholesale level at rates from 2% to 14%, depending on the food item and the time period. These farm and wholesale prices will take one to six months to pass on at to the retail level at rates of 2% to 18%. In all, this research significantly supports the premise that commodity shocks will impact the price of goods not only at the retail level, but on the farm and wholesale level as well.

Based on our review of the prior research, we observe that there is no previous work done to indicate how the concept of culture impacts the effects of pass through. There has, however, been work regarding the relationships between foreign and domestic producers, and how their relationships affect the likelihood of pass-through onto consumer prices. Hellerstein (2008)

reviews the international beer industry, finding that import-competing domestic manufacturers of beer increase their profits by lowering their prices in order to take away market share from foreign manufacturers. It is reasonable to believe that there are cultural implications which tie into this practice. Hellerstein also provides an answer for the paradox of incomplete-pass through, as "it may not be profit maximizing for foreign manufacturers to fully pass through a cost shock to a market where competing manufacturers exploit each increase in a foreign brand's price to increase market share by shrinking markups." The element of culture and the power of negotiation between supplier and retailer may be even more prominent in the pass-through process as Richards, Allender, and Hamilton (2012) suggest that commodity price shocks may facilitate market power as volatility can disguise as an increase in margins. Their work also indicates that market power increases when commodity prices are falling since stable prices can be maintained by wholesalers in response to the shifting commodity prices.

Culture and Finance

In determining the effect of national culture on the phenomenon of pass-through, an examination of national culture and cross-border financial interactions is essential. Chakrabarti, Mukherjee and Jayaraman (2007) support the importance of culture and finance in exploring the impact of culture on cross-border M&A. They find that contrary to popular belief, cross-border acquisitions perform better in the long-run if the acquirer and the target come from countries that are culturally more disparate. Companies from countries which are culturally disparate utilize many safeguards in the immersion process, and this enhanced level of preparedness works to facilitate the ease of doing business. This suggests that same trend may be seen in the pass-through of commodity shocks through the negotiations between companies of different cultural origins.

It is through the work of Geert Hofstede and his dimensions of cultural values that culture will be measured in this study. Through the use of the dimension of uncertainty avoidance, the impact of risk aversion will be used as a measurement of how shocks in commodity prices are passed-through to the pricing of final consumer goods. Hofstede (2001) characterizes those countries with a low uncertainty avoidance to be more willing to take risks in life, more at ease with a lower stress level, and to frown upon aggressive behavior. In opposition, those countries with a

high level of uncertainty avoidance will be concerned with security in life, define achievement in terms of security, and have a higher level of anxiety and stress. The concept of uncertainty avoidance has recently been a popular proxy for measuring culture's implications on cross border finance based interactions. The concept of self-protection, paired with uncertainty avoidance, is illustrated by Ramirez and Tadesse (2009) through their finding that firms in countries with high levels of uncertainty avoidance tend to hold more cash. Higher levels of liquid-asset holdings offer a way for firms to hedge against uncertainty. A look at the concept of earnings management- the magnitude of discretion that managers exercise in measuring accounting earnings- proves to show significance when combined with the elements of culture. Han et. al. (2010) finds that uncertainty avoidance of national culture explains the discretion of managers across countries concerning earnings management. The group cites the reasons for earnings management in the United States as the wishes of accountants and their superiors to meet or exceed market expectations so that financial rewards can be maximized. This is similar to the idea of pass-through across borders, where those suppliers who are more concerned with financial rewards and gaining market share would be most likely to pass on price shocks to the goods being sold by retailers. The findings show that uncertainty avoidance is negatively related to the magnitude of earnings management, indicating that those companies from countries that are considered to be more risk averse are less likely to utilize these advantageous accounting practices.

Dimensions of National Culture:

A review of national culture's impact on the world of international business is necessary to understand the implications that culture may have on the pass-through of commodity shocks. In their research on the recent advances in the realm of culture and international business, Bhagat et. al. (2005) suggest that if globalization continues to bring together various cultures across the globe, then eventually discrepancies in international business practices should be eliminated as cultures come together. In recent years, globalization has been significantly aided by the creation of such groups as the North American Free Trade Agreement (NAFTA), the European Community (EC) and the International Organization for Standardization (ISO). Typically, developing countries that have been negatively impacted by globalization's effects are found to be in opposition of globalization. However, Western countries are also providing some

opposition as professional jobs continue to be brought offshore (Bhagat et. al. 2005). Citing cultural researcher Geert Hofstede, the authors treat culture as a generally stable characteristic as culture changes very slowly. That being said, it is important pursue the impact national culture in this globalized state will have on the price transmission phenomenon.

It is known well that national culture provides significant influence on economic activities within a country, particularly when related to finance. Though the idea of culture and finance has only become a more prominent topic of interest over the past decade, there is an extensive body of work performed on the subject which supports the idea that national culture undeniably impacts actions taken regarding many basic financial topics. Hofstede (1984) says, "Culture is to a human collectivity what personality is to an individual." By assessing the a nation's culture, the business "personality" of the country can then be determined and used in decision making. The tendencies of national culture to effect the economic and business environment were assessed and categorized in the work of Hofstede (2001) in his development of four cultural dimensions: power distance, uncertainty avoidance, individualism versus collectivism, and masculinity versus femininity. Power distance addresses the disparity in workplace power between managers and their subordinates through measuring how the interpersonal power or influence is perceived between managers and subordinates. Countries scoring high within this index would be said to value hierarchy and put great difference in authority given a manger or subordinate. Uncertainty Avoidance measures the risk tolerance of a country, and its ability to cope with uncertainty about the future. Three indicators of Uncertainty Avoidance are rule orientation, employment stability and stress, on which the scores of each country are based. Individualism describes the relationship between the individual and the collective society. Some societies see individualism as a means of alienation, while others support it. This cultural dimension is reflected in the way that people live together (nuclear families, extended families, etc). Finally, Masculinity is a dimension that deals with the masculine and feminine tendencies, and how they pertain to everyday life in the workplace. Typically, men would be seen as more assertive, while women are seen as nurturing. The category in which most goals of the country fall- masculine or feminine- determines the score of the country. When assessing the scores of these dimensions by country, one can be provided with answers regarding the structuring of organizations, the

motivations of people within these organizations, as well as the issues these organizations will face within society (Hofstede, 2001). The cultural implications of pass-through will be measured by the Uncertainty Avoidance score assigned to the country from which the company comes.

To properly evaluate the merits of one measurement of national culture, it is imperative to investigate the research resulting from other studies of the same subject. The Global Leadership and Organizational Behavior Effectiveness (GLOBE) study (2004) was identified as one such project with similar characteristics to the study done by Hofstede. The GLOBE study was conceived by Robert J. House in 1991 in pursuit of an international research project based on leadership. Eventually, he delved into other facets of organizational cultures, thus leading to the GLOBE standing today as one of the four major cross-cultural research projects (Hofstede, 2006). This was achieved by measuring practices and values that were present at levels of industry (financial services, food processing, and telecommunications), organization (various across industry) and society. Sixty-two cultures were surveyed through research performed by one hundred and seventy investigators who acquired data from 17,300 managers in 951 organizations (House et al. 2004). Similar to the work done by Hofstede in 1980, the GLOBE study formed cultural dimensions by which societies can be measured: Future Orientation, Gender Equality, Assertiveness, Humane Orientation, In-group Collectivism, Institutional Collectivism, Performance Orientation, Power Distance, and Uncertainty Avoidance. Future Orientation in the context of this research can be defined as the degree to which "future- oriented behaviors such as planning and delaying gratification" are rewarded by society (House et. al. 2004). Gender equality pertains to the division of roles within society between men and women, while assertiveness measures the degree to which a society values a person to be aggressive and tough in social relationships (House et al. 2004). Humane Orientation pertains to the degree to which members of a society are fair, friendly, generous and caring to others. Individualism and Collectivism, as previously explored in Hofstede's work, relates to the value of maintaining a sense of loyalty to oneself or to the group as a whole within society (House et al. 2004). Performance orientation is the extent to which innovation and high standards are rewarded within society. Power distance explains the acceptance of authority and the value placed on status. Finally, Uncertainty avoidance, identical to the dimension in the work performed by Hofstede, pertains to the perception of risk within a society and their perceived level of risk

tolerance (House et al. 2004). The GLOBE study assigns scores to each country for each criterion in two dimensions: "as is" and "should be." The "as is" category indicates the perception of the individual interviewed on how they exhibit the dimension at hand. The "should be" category is related to the perceived value of the dimension as seen by the society as a whole.

Within the context of our research, uncertainty avoidance has been identified as the most important dimension by which to determine the impact of national culture on price transmission. Uncertainty avoidance relates directly to risk, and therefore the likelihood of a company within a society to pass-through the shocks experienced in a commodity price. The use of this dimension in the more current GLOBE study works to support the validity of the work of Hofstede within the context of our research. In agreement with the work of Hofstede, the GLOBE study finds that the dimension of uncertainty avoidance can be applied to both social and organizational levels of analysis (House et al. 2004). The GLOBE study conducted research distinguishing between societal and organizational exhibitions of uncertainty avoidance, and defined the dimension in terms of "the tendency toward orderliness, consistency, structure, and regulation in society" (House et al. 2004). In the research performed by the GLOBE group, it was found that there was a negative association between practices and values within the context of society, suggesting that the level of organization at the enterprise level is directly related to the level of organization in society. In support of this, industrialized nations scored high in the GLOBE uncertainty avoidance in terms of their "as is" perception, and low in "should be" values, with the opposite being true for less developed nations (House et al. 2004).

There are a vast number of merits and faults that can be found within both the work of Hofstede and the GLOBE study, and it is important to address the glaring differences in the two measures that will be used to indicate uncertainty avoidance. Members of the research team from the GLOBE study respond to various criticisms of their work with a response to inaccuracies they perceive to be present in the work of Hofstede. The authors point to the data collection methods of Hofstede as being inaccurate and poorly representative of the cultures of nations as his collection was centered on the needs of IBM, for which he was working (Dorfman et. al. 2006). Conversely, Hofstede states that his work remained decentered in its pursuit of identifying national culture, while the GLOBE study was too U.S. centered. While a network of international

participants worked to develop and carry out the GLOBE research study, it was a team of 25 U.S. based academics that participated in editing the work (Hofstede 2006). Another discrepancy between the two groups is the nature of the measurements. Hofstede indicated that individuals are better observers of others than themselves, and asked respondents to score their country overall. Alternately, the researchers working on the GLOBE study chose to ask individuals about the cultural tendencies in terms of what is practiced and what is valued (Dorfman et. al. 2006). Hofstede criticizes this move and says that asking questions in the "as is" format assumes that the responder is in the position to compare their society with another. Finally, the GLOBE researchers state that there is a false sense that Hofstede is the authority on all information concerning the dimensions of national culture, and no one researcher can dominate the field (Dorfman et. al. 2006). The two studies do, however, have a great number of similarities, one in particular being that they have a common industrial setting.

HYPOTHESES

Through our extensive review of literature, we propose the following hypotheses:

H_1: Companies that are incorporated in a risk averse country (high UAI score) will tend to pass on commodity price shocks, thus leading to a higher market value for that company.

H_2: Companies that are incorporated in a country that is not risk averse (low UAI score) will not pass on commodity price shocks, thus leading to a lower market value for that company.

METHODOLOGY

Measures:

The effects of pass-through are measured by the change in the value of a company as related to instances of commodity price shocks. Four different methods of valuing companies were utilized as dependent variables in this study. The first was *return*, which is a measure of the companies' month over month change in stock price. *Market capitalization*, the number of shares outstanding a company has multiplied by the value of its shares, is a way that the overall value of the firm was indicated. Additionally, the month over month change in *market capitalization* was used to determine *company value*. *Profit* was used as a dependent variable in the study and was measured by the net income of the companies. Regression analysis was used to determine statistical significance of variables against the determination of the aforementioned dependent variables. Regression analysis was also performed taking into account the score of uncertainty avoidance (high or low) and the impact that culture would have on the value of the firm.

Data Sources:

A significant portion of this research was spent in the acquisition of viable data. The S&P Capital IQ database was utilized in order to acquire all company level information. Through the database, it was possible to set specific criteria when pulling data. In order to maintain consistency across each commodity chain, company information was pulled from Capital IQ according to the following criteria: primary industry classification, company status (operating), company type (public), and country of incorporation. The data pulled from the Capital IQ database was purely financial in nature, yielding information for the following categories: market capitalization, day close price of stock, total revenue, gross profit, EBITDA, net income, total cash and short-term investments, total assets, total current assets, total short-term borrowings as a percent of debt, long-term debt, total receivables, accounts payable, and inventory. Information was pulled from the database for the last five years because this time frame offered the most consistent sampling of data.

The historical prices of commodities were pulled from the historical database on Yahoo! Finance. Information on coffee was pulled for monthly prices over a five year period 2008-2012 from the index iPath DJ-UBS Coffee TR Sub-Idx ETN (JO). Cotton prices were pulled for monthly prices

over a five year period 2008-2012 from the index iPath DJ-UBS Cotton TR Sub-Idx ETN (BAL). Steel prices were pulled for monthly prices over a five year period 2008-2012 from the index Market Vectors Steel ETF (SLX). Commodity shocks were determined by calculating the percent change month over month for each of the commodities across the five year period. After analyzing the various percent changes exhibited during the five year period, it was determined that a change of positive or negative 10% month over month would indicate a commodity price shock.

The information on country scores of uncertainty avoidance was compiled from the most recent work of Geert Hofstede. Within his most recent publication is a listing of countries and their associated scores for each cultural dimension (Hofstede 2001). We imported this data into our model according to the countries being measured.

Information regarding the country level variables was pulled from various international organizations. Information on country GDP per capita was obtained from the World Bank database as well as the CIA World Fact Book. Transparency International provides an annual assessment of corruption presence in countries, and is widely considered to be the premier authority on the subject. The country's corruption rank (lower meaning least corruption) was used as an independent variable in our regression analysis. The Heritage Foundation , in partnership with The Wall Street Journal, produces an annual ranking of countries across the world and their perceived economic freedom across. An aggregate ranking is given across all countries, and countries are also scored in how well they incorporate economic freedom into specific categories such as government spending, business freedom and investment freedom to name a few. Four the purpose of this research, economic freedom in respect to trade was analyzed for the countries involved in the study.

Research Analysis:
Each selected industry associated with coffee, cotton or steel was identified by its respective Standard Industrial Classification (SIC) code. Regression analysis was run on each individual SIC code in order to determine results within that particular industry, as well as its position within the supply chain associated with its commodity. In addition to the key predictive variables of interest, uncertainty avoidance and commodity shocks, additional independent variables were

tested in order to determine if they had any additional significant impact on the dependent variable.

Three country level indicators were selected in order to control for the effects that the country of incorporation itself may have on the value of the firm. One such variable is *GDP per capita* of the country in which the firm is incorporated, which was selected to check for interaction between the wealth of the nation and its overall risk tolerance. The *corruption rank* of the nation of incorporation was used as an independent variable to determine if there as a significant relationship between company market value change and corruption, but also to check for any relationship between risk tolerance and corruption. The level of perceived *economic freedom in terms* within the country of incorporation was incorporated as a way to see if the change in value of the companies investigated was in any impacted by their ability or inability to trade across borders rather than by uncertainty avoidance or commodity shocks.

Two firm level indicators were also incorporated into the regression analysis in order to control for company specific factors that may contribute to its change in market value. *Long-term debt* was selected as it provides a significant measure of the firm's debt holdings, which may significantly contribute to its overall market value. *EBITDA*, or earnings before interest, taxes, depreciation and amortization, was incorporated to the regression analysis for its merit as an indicator company performance. *EBITDA* is not recognized as a formal profit indicator, but provides a high level overview by which companies may be compared before adjusting for local expenses such as tax or forms of financing that have been taken on.

All data being considered in the regression analyses are quantitative. This study performed regression analysis on the aforementioned variables in a three stage process. First, each selected industry associated with coffee cotton and steel was identified by its SIC code, then regression analysis was run on each individual SIC code in order to determine results within that particular industry, as well as its position within the supply chain associated with its commodity. In addition to the key predictive variables of interest, *uncertainty avoidance* and *commodity shocks*, additional independent variables were tested in order to determine if they had any additional significant impact on the dependent variable. The regression was run to determine the initial relationship between company value in the presence of shocks (indicative of pass through) and

uncertainty avoidance. Data sets containing the information for each country level, firm level and industry level indicator were merged into Statistical Analysis Software (SAS) to perform regression analysis on the outlined variables. While regression analysis was run with uncertainty avoidance and commodity shocks as independent variables, additional variables that were considered in the study were *GDP per capita* in the country of incorporation, *corruption ranking* of the country of incorporation, *economic freedom of trade* in the country of incorporation, *long-term debt*, and *EBITDA*. P-values of uncertainty avoidance scores, GDP per capita, Corruption Ranking, Economic Freedom in trade, long-term debt, EBITDA, and commodity shocks were analyzed to determine significance to the various models of dependent variables. Once significance was determined, the parameter estimate of the variable was used to determine the direction of the relationship between the independent variable and dependent variable.

In the second stage of the process, companies were split into two separate groups: those incorporated in countries with a high level of uncertainty avoidance, and those incorporated in countries with a low level of uncertainty avoidance. The high uncertainty avoidance grouping was made up of those companies from countries scoring in the top 25% of the uncertainty avoidance scores, which in this study equated to scores greater than or equal to 51. The low uncertainty avoidance grouping was made up those companies from countries scoring in the bottom 25% of the uncertainty avoidance scores, which equated to scores less than or equal to 40. By creating these two groupings of companies, regression analysis was first run for companies within the steel industry. In order to get a better sense of how this would be significant across an entire supply chain, the regression analysis was first run in SAS on the data only from the steel commodity chain. The steel commodity chain has the most complete commodity supply chain, and also the highest number of observations available within each individual SIC category. Regression was run for the two groupings of uncertainty avoidance for steel at each SIC code within the company value categories: return, market capitalization, market capitalization delta and profit.

After testing within the steel supply chain, the regression was performed across all three commodity chains. This is the process through which the hypotheses were tested. Again, the high uncertainty avoidance grouping was made up of those companies from countries scoring in the

top 25% of the uncertainty avoidance scores, which in this study equated to scores greater than or equal to 51. The low uncertainty avoidance grouping was made up those companies from countries scoring in the bottom 25% of the uncertainty avoidance scores, which equated to scores less than or equal to 40. The chains were divided into coffee, cotton and steel and each commodity was a product of the summation of each SIC in the chain. An aggregate industry was formed from the information of each SIC code within the respective commodity chains, and regression analysis within SAS was performed on each respective aggregate commodity measure. High and low uncertainty avoidance score companies within the coffee, cotton and steel categories were also tested for significance within the four company value categories as well.

Data Transformation:

Before any regressions could be run on the data, it was imperative that the information be properly formatted to be merged into SAS. The output from the Capital IQ database provides data in a horizontal output, while SAS needs to read information categories by column from within a CSV file. The amount of data collected within this project was so vast that it could not all fit in one excel file due to size limitations. Just under 2,000 companies were represented in this study with quarterly data across five years for seven different independent variables, so the amount of time it took to format data for the needs of the software was significant.

RESULTS

Preliminary Findings:

Preliminary regression analysis was run to test four different dependent variables for company value: month over month return on company stocks, market capitalization, and month over month change in market capitalization and profit in terms of net income. These initial tests were performed in order to determine the potential significance of culture across the selected industries and commodity chains.

Return:

When looking at the results from the statistical model that uses the month over month return on companies' stock prices as its dependent variable, the variable was only somewhat effective as only ten instances of statistical significance were exhibited across the eleven SIC codes. Additionally, only four of the models produced by this regression were found to be statistically significant, with three of the models only explaining a mere 10% or less of the data in its regression.

Long-term debt is the most noteworthy independent variable as it was statistically significant across four different SIC codes, all within the steel industry. The SIC codes representing companies at the intermediary level are most significantly impacted with all three codes finding statistical significance with this variable, while the last SIC code to be impacted by this variable is SIC 3312, which represents companies at the initial stage of the steel supply chain. What's interesting is the positive relationship between long-term debt and stock returns that is found within SIC codes 3312, 3316 and 3341. The positive relationship indicates that as long-term debt increases, so does the return on the stocks, representing that the companies are issuing more debt. Another interesting relationship is that between GDP per capita and return at the front end of the supply chain in SIC 3325. This negative relationship suggests that as GDP per capita decreases, the returns on the company stock increase. This may indicate that citizens of the country of incorporation may not directly invest in the stocks of the companies listed as their decrease in wealth would not contribute to a boost in returns for said companies.

Of the two key variables of interest, uncertainty avoidance and commodity shocks, commodity shocks was only significant once within the steel supply chain for SIC 3317. This variable had a

coefficient of 23.74, indicating a strong positive relationship between commodity shocks and the value of companies in this industry. Shocks appear to be welcome, as an increase in commodity shocks within the industry increase the return on the stocks of the company.

Market Capitalization:

In analyzing the data resulting from the regression of company market capitalization as the dependent variable, it is clear that this was the most significant dependent variable of all measured within this study. This particular regression yielded twenty-two instances of statistical significance across the eleven SIC codes. Within this regression, eight models were found to be statistically significant, however only three of these models were representative of more than 50% of the data.

EBITDA was the most influential independent variable, resulting in its statistical significance within seven SIC codes. Yet again, steel was the industry responds most significantly to this variable with five of its six SIC industries being impacted. The negative relationship between EBITDA and the market capitalization is particularly interesting within the industries of SIC 2095, 3312, 3341 and 3500 as this insinuates that as EBITDA (a profitability measure) decreases, the market capitalization of a company in said industries would increase. This is counter intuitive as an increase in profitability should indicate an increase in firm value, but is not exhibited within these results. There is no present trend indicating that the impact of this variable is more significant at any level of the supply chain. Of all industries, SIC 5600, apparel and accessory retailers, had the most independent variables indicating statistical significance. Two financial variables, long-term debt and EBITDA, were significant to the market capitalization of companies in this industry. This is the only industry in which both variables of interest, uncertainty avoidance and commodity shocks, were found to be statistically significant. This indicates that companies operating within this industry are both shock sensitive and are impacted by the uncertainty avoidance level of their country of incorporation.

As a whole, commodity shocks and uncertainty avoidance appear to be equally significant across the industries. Four instances of statistical significance were cited for uncertainty avoidance within SIC 2095 coffee roasters, SIC 5812 eating places (serving coffee), SIC 5600 apparel and accessories retailers, and SIC secondary smelting and refining of nonferrous metals. This shows

that uncertainty avoidance was most impactful at the final stage of the commodity chain. This relationship between the independent variables and market capital indicates that as the level of uncertainty avoidance decreases, the market capitalization of the company increases. This seems to go against the hypothesis that firms incorporated in companies with low uncertainty avoidance scores are more likely to absorb a commodity shock and therefore decrease in value. Commodity shocks were statistically significant in four instances at SIC 5600 apparel and accessory retailers, SIC 3312 steel works blast furnaces and rolling mills, SIC 3325 steel foundries and SIC 3316 cold finishing of steel shapes. The positive relationship between commodity shock and market capitalization indicates that as these industries experience shocks in the price of inputs, they will increase in market value. These companies may be benefitting from high prices, value added processing, or potentially preferred access to raw materials. Overall, commodity shocks were most significant within the initial stage of the supply chain.

Market Capitalization Delta:

When considering the data from the regression models using the change in market capitalization of companies as the dependent variable, the results are somewhat significant with ten instances of statistical significance across the SIC codes represented. Five of the eleven models produced were statistically significant, but only one of them explained more than 25% of the data within its model.

In looking at the independent variables, long-term debt is most impactful with five instances of statistical significance. Four of the five instances occur within the steel commodity with one occurring at the start of the commodity chain and three within the intermediary industries. The other instance occurs within the beginning level of the coffee supply chain. The relationships are varying across the industries represented with some having an inverse effect on the change in market capitalization, while others exhibit a positive relationship where an increase in long-term debt would increase the change in market capitalization. Interestingly, the two country level indicators were statistically significant in this industry with the corruption ranking and level of economic freedom of trade within the companies' country of incorporation impacting the change in market capitalization of the companies in the industry. Corruption ranking was found to have an inverse relationship with the change in market capitalization. Interestingly, the level of

economic freedom of trade was found to have an inverse relationship with the change in market capitalization, which shows that as economic freedom of trade decreases, the change in market capitalization increases across the companies in this industry.

The two variables of interest, uncertainty avoidance and commodity shocks, were not found to be statistically significant in any of the industries measured within this regression.

Profit:

The regression models using the profit of the companies as the dependent variable produced results that were reasonably significant with fifteen instances of statistical significance occurred across the SIC codes represented. Eight of the eleven models produced were found to be significant, with five of them explaining at least 20% of the data and three of them explaining over 75% of their data.

Of the independent variables that were utilized in this regression, EBITDA was the most significant with eight significant relationships across the SIC codes. Again the steel industry as a whole is most impacted by this independent variable with five of its six SIC codes all finding EBITDA to be statistically important. There is no clear trend indicating that the impact of EBITDA is most prevalent at any one point in the supply chain of the commodities. However, it was clear that EBITDA has a strong positive relationship with profit. These results are expected as the profitability of a company is measured both in EBITDA and net income.

The two variables of interest, uncertainty avoidance and commodity shocks, were not highly significant. Uncertainty avoidance was only impactful within the industries of eating places that serve coffee and apparel and accessory retailers. It is interesting to note that both of these observations occur at the final level of the supply chain of the commodities, indicating that uncertainty avoidance may be most prevalent at the final stage of the chain. In both instances, the positive relationship indicates that companies with higher levels of uncertainty avoidance are more likely to have high profitability in these industries. Commodity shocks were only found to be statistically significant within one of the intermediary cotton industries, which may suggest that commodity shocks are more significant to those companies that are wholesalers of a good.

This positive relationship between commodity shocks and profit suggests that this level of the cotton industry benefits from a sudden increase or decrease in the price of the input.

Steel Commodity Chain Findings:

Once preliminary results were obtained for the significance of culture (uncertainty avoidance) and commodity shocks on companies across the various supply chains, the variable of uncertainty avoidance was split in two different groups, one containing companies from countries with a high level of uncertainty avoidance and the other containing companies in countries with a low uncertainty avoidance score. The high uncertainty avoidance grouping was made up of those companies from countries scoring in the top 25% of the uncertainty avoidance scores, which in this study equated to scores greater than or equal to 51. The low uncertainty avoidance grouping was made up those companies from countries scoring in the bottom 25% of the uncertainty avoidance scores, which equated to scores less than or equal to 40. By creating these two groupings of companies, regression analysis was first run for companies within the steel industry. The steel industry was chosen for initial testing as it had the greatest number of observations. Regression was run for the two groupings of uncertainty avoidance for steel at each SIC code within the company value categories: return, market capitalization, market capitalization delta and profit.

Initially, the steel industry was used as the test data for this hypothesis due to the large number of observations and the fact that it contains companies representing each level within the steel supply chain from start to finish. In looking at high UAI countries in this initial test setting, this study found five instances of significance. The majority of the significance was found to occur when market capitalization was used as the determinant of company value, and that is the table being shown here. All instances of significance had positive coefficients which indicate that as commodity shocks occur, the value of the companies impacted tend to increase with the shocks. With steel serving as a proxy for all commodities, it would seem as though culture did in fact play a role in the pass-through of commodity shocks when companies are incorporated in countries with a high level of uncertainty avoidance.

When considering low UAI countries, this study only found two instances of significance, both occurring when market capitalization was used as the determinant of company value. The two

instances of significance occurred towards the end of the steel supply chain within the industries SIC 3341, an industry participating in the secondary smelting and refining of nonferrous metals, and also within SIC 3500, which is a final stage industry representing industrial machinery and equipment producers. With steel serving for a proxy of all commodities, findings would suggest that culture in terms of uncertainty avoidance could again play a significant role in the pass-through of commodity price shocks.

Aggregate Commodity Chain Findings:

Once again, the variable of uncertainty avoidance was split in two different groups, one containing companies from countries with a high level of uncertainty avoidance and the other containing companies in countries with a low uncertainty avoidance score. The high uncertainty avoidance grouping was made up of those companies from countries scoring in the top 25% of the uncertainty avoidance scores, which in this study equated to scores greater than or equal to 51. The low uncertainty avoidance grouping was made up those companies from countries scoring in the bottom 25% of the uncertainty avoidance scores, which equated to scores less than or equal to 40.

In considering all three commodities, this study finds that commodity shocks were only found to be significant in three instances, two of which are shown here. This Table displays the value of the companies when measured by profit. One other instance of significance appeared for Steel when market capitalization was used as the value measure. Overall, these findings do not show a significant impact of culture on pass-through.

Hypothesis Testing

To initially test the hypotheses, the effect of the uncertainty avoidance score was measured by splitting the measure of uncertainty avoidance into two separate variables: high uncertainty avoidance and low uncertainty avoidance. The high uncertainty avoidance variable consists of the scores in the top 25% of the UAI scores. The low uncertainty avoidance variable consists of the bottom 25% of the UAI scores

H_1: Suppliers that are incorporated in a risk averse country (high UAI score) would tend to pass on commodity price shocks, thus leading to a market value for that company.

When considering the commodities of coffee, cotton and steel, this study finds results to reject hypothesis 1, as uncertainty avoidance (culture) did not play a significant role in the pass through of commodity price shocks within companies incorporated in countries with high uncertainty avoidance scores.

Initially, the steel industry was used as the test data for this hypothesis due to the large number of observations and the fact that it contains companies representing each level within the steel supply chain from start to finish. In this initial test setting, this study found five instances of significance. The majority of the significance was found to occur when market capitalization was used as the determinant of company value, and all had positive coefficients which indicate that as commodity shocks occur, the value of the companies impacted tend to increase with the shocks. Three of the instances of significance were found within the industry SIC 3316, which is an intermediary firm participating in the cold finishing of steel shapes. With steel serving as a proxy for all commodities, it would seem as though culture did in fact play a role in the pass-through of commodity shocks when companies are incorporated in countries with a high level of uncertainty avoidance.

In considering all three commodities, this study finds that commodity shocks were only found to be significant in two instances, when measuring the value of steel companies by market capitalization and when measuring the value of cotton companies at the profit level.

In looking at the model that measures profitability of companies by their market capitalization, commodity shocks were significant for those companies involved in the steel commodity chain with a P-value of <.0001, which indicates undisputable significance. The coefficient of 0.72 for this variable indicates a positive relationship between commodity shocks in the steel industry and market capitalization. As commodity shocks increase, the market capitalization of the companies in this segment also increases. This is in line with our hypothesis that those companies with high levels of uncertainty avoidance would be more likely to pass on the shocks in commodity prices, thus leaving their profit margins unaffected and contributing to an overall increase in firm value. The findings within this model have an overall R-square value of 0.0393, which indicates that only about 4% of the data are explained by this model.

When using firm profit as the measure of company value, commodity shocks were found to be significant for those companies involved in the cotton commodity chain with a P-value of <.0001, which indicates definite significance. The coefficient of 0.19 for this variable indicates a positive relationship between commodity shocks in the cotton industry and profit. When commodity shocks occur, there appears to be an increase in profit for those companies involved in the cotton industry. Companies involved in this industry see an overall increase in profit when commodity shocks occur, which is in line with our hypothesis that companies from countries with high levels of uncertainty avoidance are more likely to pass on commodity shocks, thus leaving their profit margins unaffected and contributing to an increase in firm value. The findings within this model have an overall R-square value of 0.6442, which indicates that 64% of the data are explained by the value, lending further support to its findings.

Despite these two instances of significance, commodity shocks were found to have a nonexistent impact on the value of companies when considering all cotton, coffee and steel companies across the four firm value measures. Therefore, it can be concluded that culture, in terms of uncertainty avoidance, has no bearing on the pass-through tendencies of companies incorporated in countries with high uncertainty avoidance scores.

> H_2: Suppliers that are incorporated in a country that is not risk averse (low UAI score) would not pass on commodity price shocks, thus leading to a higher market value for that company.

When considering the commodities coffee, cotton and steel, this study finds results to reject hypothesis 2, as uncertainty avoidance (culture) did not play a significant role in the pass through of commodity price shocks within companies incorporated in countries with low uncertainty avoidance scores.

The steel industry was initially used as the test data for this hypothesis due to the large number of observations and the fact that it contains companies representing each level within the steel supply chain from start to finish. In this initial test setting, this study only found two instances of significance, both occurring when market capitalization was used as the determinant of company value. The two instances of significance occurred towards the end of the steel supply chain

within the industries SIC 3341, an industry participating in the secondary smelting and refining of nonferrous metals, and also within SIC 3500, which is a final stage industry representing industrial machinery and equipment producers. With steel serving for a proxy of all commodities, findings would suggest that culture in terms of uncertainty avoidance would not play a significant role in the pass-through of commodity price shocks.

In analyzing all three commodities, this study finds that commodity shocks were only found to be significant in one instance, when measuring the value of cotton companies by profit.

In looking at the model that uses profit as the measure of company value, commodity shocks were found to be significant for those companies involved in the cotton commodity chain with a P-value of <.0001, which indicates definite significance. The coefficient of 0.20 for this variable indicates a positive relationship between commodity shocks in the cotton industry and profit. When commodity shocks occur, there appears to be an increase in profit for those companies involved in the cotton industry. Companies involved in this industry see an overall increase in profit when commodity shocks occur, which is in line with our hypothesis that companies from countries with high levels of uncertainty avoidance are more likely to pass on commodity shocks, thus leaving their profit margins unaffected and contributing to an increase in firm value. The findings within this model have an overall R-square value of 0.6259, which indicates that about 63% of the data are explained by the value, lending further support to its findings.

Despite this instance of significance, commodity shocks were found to have an insignificant impact on the value of companies when considering all cotton, coffee and steel companies across the four firm value measures. Therefore, it can be concluded that culture, in terms of uncertainty avoidance, has no bearing on the pass-through tendencies of companies incorporated in countries with low uncertainty avoidance scores.

LIMITATIONS OF THE STUDY

Though a vast amount of data was utilized within this study, there were certain limitations with our base of information. To begin with, our access to a limited amount of company financial information severely restricted our ability to address companies at all three levels of the supply chain within the three commodities selected. Access to company information was limited to what is reported in most financial databases, and Capital IQ provided the most robust selection of information given these restrictions. Capital IQ provides a significant amount of information, but only for companies that are publically traded. Additionally, most databases to which we had access were reporting a significant amount of data on companies within the United States, rather than abroad. Given the restriction on company information to only those publically traded, it was not possible to complete the commodity supply chains with an SIC industry represented at every level. If financial information on private companies was available our supply chains would have been more complete and the number of observations across the eleven SIC codes would have been robust.

In deciding which measure of uncertainty avoidance was best to use within this study, the results from Hofstede's work were utilized because they were more varied in the number of cultures included, while the GLOBE study only provided information for 62 societies. The limits on cultural information challenge the significance of this data as we are limited to only countries which have been assessed by Hofstede.

The period of time used to measure data in our study, five years, is rather limited in terms of industry scope. While it would have been possible to get information for companies dating back to the past 10 years, the information available became more scattered, with significant information missing in the earlier years. For the sake of consistency, five years was the longest time series available.

Consumer Loss at Profit Gain

Within the context of this study, it was assumed when price shocks are passed on from producer to consumer it would create an increased market value for the producer. Prior research finds that producers are more likely to pass on a positive shock in commodity prices (increase in price) to consumers in order to maintain their profit margins. Also, it has been found that retailers will

not readily lower their price when commodity costs are decreasing in price (Richards and Pofhal 2009). While this adjustment in price will allow for the firm producing the retail goods to maintain a steady profit stream, the negative impact the price increase has on consumers may drive away business. The fluctuation of input pricing is likely to have an impact on how competing firms price their retail goods, and thus may impact the amount of business that a firm passing on a positive shock would normally have.

Globalization:

This study did not take into account the effects of globalization as they may apply to the data. The country of incorporation of a company was used as a proxy for the culture tied to the firms under consideration. In this day and age, it is highly likely that one company may have representation in multiple countries, and may operate differently within each country. However, the profits of the company are reported in aggregate, and do not distinguish between country of origin. Additionally, many firms have decided in recent years to relocate to a new country of incorporation in order to seek tax benefits and avoid excessive taxation in countries such as the United States. That being said, it very well may be that a company that originated within the United States and is run by executives from the United States may in fact be incorporated Bermuda for taxation purposes. It is assumed in this study that the country of incorporation is representative of the culture of the company, but that may not be the case.

Magnitude of Data:

While it has been said that the data used in the context of this research was lacking in terms of completeness, the sheer volume of information collected for this study was significant. Information was collected on over 1,900 companies, with respect to 11 different independent variables per company, which were collected on a monthly or quarterly basis for five years. This information was so significant in size that the data being analyzed had to undergo significant data transformation before it could be merged into the SAS program for regression analysis. While the breadth of information is obvious, the depth was somewhat lacking in that only one complete commodity chain could be completed due to restrictions in data availability.

CONCLUSIONS:

Culture, the most basic facet by which differences between nations are assessed, has obvious implications for both the everyday consumer and today's international business. While this study did not find that culture was a statistically significant driver of the pass-through of commodity shocks in terms of the commodity markets observed, this information provides significant findings going forward. It can be supposed that through this data, while differences in culture are not as frequently observed and leveraged in the business environment as previously thought- particularly with respect to the commodities market- it can be realized that globalization may be a more significant factor in the international dealings of businesses than previously believed. While consumers continue to operate under the premise that differences in their culture will translate into differences in the brands from which they purchase their products, it is seen in this study that the differences in businesses in terms of their operations with respect to culture are not significant at all. In fact, by the measures of this study, culture played an almost negligible role in the determination of firm value, and thus the relationship to commodity price shock pass-through.

Despite the fact that this study did not reveal significant findings for the importance of culture as related to international business relations and negotiation, it should be noted that this study provides new information for international brand managers looking to work with suppliers or downstream retailers across borders. In knowing that culture does not have a significant role in determining the effects that culture will have on the prices businesses post in relation to commodity price shocks, managers can rule out the necessity of working with culturally close companies in order to realize the most significant benefits in such a market.

RECOMMENDATIONS FOR FUTURE RESEARCH

In moving forward with the results of this research, it would first be suggested that the study encompass only one commodity supply chain. Through this, it will be more possible to collect full and complete information for the different levels of the supply chain. In focusing on one specific commodity rather than three, it will also become more possible to investigate the historical trend of the commodity on a longer timeline, rather than just over the past five years. It is recommended that a commodity that reaches a broader base of final retail products be used as a proxy for the transmission of commodity price shock pass-through. Within the context of this study, steel, which can be found in a myriad of final consumer goods, provided the most complete and expansive body of information due to the significant number of industries working within the realm of this specific commodity.

The results from this research did not yield statistically significant information in respect to culture's relationship with commodity price shock pass-through. This was due in part to the fact that some of the companies represented in this study were present in more than one SIC code within the commodity's supply chain. In today's global economy, it is truly difficult to identify companies that are involved in a pure play business structure, meaning that they are only involved in one single industry, and none of the upstream or downstream activities. As an example, while coffee roasters and eating places selling coffee beverages represent two different ends of the coffee supply chain, often times it is found that the coffee beverage retailer has integrated backward in order to achieve cost advantages in its coffee supply. This is seen in the example of Starbucks taking ownership of coffee roasting facilities, which exclusively produce for the Starbucks retail locations. In situations such as this, commodity shock pass-through would not be able to be measured as the cost difference passed along the supply chain as activities along the chain would be owned and supported by one firm.

It is also advisable that companies from culturally disparate countries are investigated in an isolated manner, rather than simply investigating companies from countries which have available data. By first identifying countries with cultures that are significantly and measurably different, a more significant measurement of the differences should be seen between the two when regression analysis is performed. The companies in this study were primarily concentrated in the

United States due to the fact that the most information was available within the Capital IQ database on US incorporated firms.

APPENDICES:

Appendix A: Sample Capital IQ Company Output

S&P CAPITAL IQ

Capital IQ Company Screening Report

Company Name	Exchange:Ticker	Industry Classifications	Company Status	Company Type	Country of Incorporation	Market Capitalization [Latest - 59 Month(s)] ($USDmm, Historical rate)	Day Close Price [Latest - 59 Month(s)] ($USD, Historical rate)	Total Revenue [Latest Quarter - 19] ($USDmm, Historical rate)	Gross Profit [Latest Quarter - 19] ($USDmm, Historical rate)	EBITDA [Latest Quarter - 19] ($USDmm, Historical rate)	Net Income [Latest Quarter - 19] ($USDmm, Historical rate)
Miko NV (ENXTBR:MIKO)	ENXTBR:MIKO	Coffee (Primary)	Operating	Public Company	Belgium	102.3	82.57	31.2	14.5	4.02	1.33
Ten Peaks Coffee Company Inc (TSX:TPK)	TSX:TPK	Coffee (Primary)	Operating	Public Company	Canada	50.8	7.61	8.79	2.9	1.89	0.848
Four Seas Mercantile Holdings Ltd. (SEHK:374)	SEHK:374	Coffee (Primary)	Operating	Public Company	Cayman Islands	146.8	0.367	72.6	18.6	2.61	1.66
Grupo Nutresa SA (BVC:NUTRESA)	BVC:NUTRESA	Coffee (Primary)	Operating	Public Company	Colombia	3,383.4	7.78	489.6	194.2	84.6	61.5
Tata Global Beverages Limited (BSE:500800)	BSE:500800	Coffee (Primary)	Operating	Public Company	India	1,193.9	1.93	252.1	2.59	26.4	20.1
Nestle India Ltd. (BSE:500790)	BSE:500790	Coffee (Primary)	Operating	Public Company	India	3,392.7	35.19	227.7	31.4	41.6	23.8
Ruchi Soya Industries Limited (BSE:500368)	BSE:500368	Coffee (Primary)	Operating	Public Company	India	398.6	2.19	-	-	-	-
CCL Products (India) Ltd. (BSE:519600)	BSE:519600	Coffee (Primary)	Operating	Public Company	India	50.4	3.79	32.4	1.96	4.66	4.25
Joonktollee Tea & Industries Limited (BSE:590079)	BSE:590079	Coffee (Primary)	Operating	Public Company	India	-	-	-	-	-	-
Mayora Indah PT (JKSE:MYOR)	JKSE:MYOR	Coffee (Primary)	Operating	Public Company	Indonesia	104.4	0.136	74.4	14.7	8.03	2.77

In this data set from Capital IQ, columns represent the independent variables pulled within the first set of company information acquisition. Data was pulled over a 60 month period, or quarterly. All data was collected for a five year period. This sample data comes from the first set of data pulls within the coffee roasters industry.

Appendix B: Country Level Variables

Hofstede Uncertainty Avoidance Scores, GLOBE Study Scores, Corruption Index Values, Economic Freedom: Trade Values

Int'l Country Code	Country	Hofstede Uncertainty Avoidance	GLOBE Uncertainty Avoidance- Practices/ As Is	GLOBE Uncertainty Avoidance- Values/ Should Be	GDP Per Capital 2011	Corruption Rank	Corruption Score	Economic Freedom : trade freedom
		UAI	G_UAI 1	G_UAI 2	GDP CAP	Corr. RANK	Corr. SCORE	EF: Trade
32	Argentina	86	3.65	4.66	10941.96	102.00	35.00	67.60
36	Australia	51	4.39	3.98	60979.03	7.00	85.00	86.20
40	Austria	70	5.16	3.66	49608.76	25.00	69.00	87.20
76	Brazil	76	3.60	4.99	12593.89	69.00	43.00	69.70
124	Canada	48	4.58	3.75	50345.43	9.00	84.00	87.90
156	China	30	4.94	5.28	5444.79	80.00	39.00	71.60
170	Colombia	80	3.57	4.98	7104.03	94.00	36.00	72.20
188	Costa Rica	86	3.82	4.58	8646.80	48.00	54.00	85.10
208	Denmark	23	5.22	3.82	59852.17	1.00	90.00	87.10
218	Ecuador	67	3.68	5.16	4496.47	118.00	32.00	68.10
818	Egypt	80	4.06	5.36	2780.95	118.00	32.00	74.00
222	El Salvador	94	3.62	5.32	3701.99	83.00	38.00	79.00
826	England	35	4.65	4.11	39038.46	17.00	74.00	87.10
246	Finland	59	5.02	3.85	48823.30	1.00	90.00	87.10
250	France	86	4.43	4.26	42377.42	22.00	71.00	82.10
276	Germany	65	5.22	3.94	44059.83	13.00	79.00	87.10
300	Greece	112	3.39	5.09	25621.67	94.00	36.00	82.10
320	Guatemala	101	3.30	4.88	3178.08	113.00	33.00	84.60
344	Hong Kong	29	4.32	4.63	35156.39	14.00	77.00	90.00
348	Hungary	82	3.12	4.66	14043.66	46.00	55.00	87.10
356	India	40	4.15	4.73	1488.51	94.00	36.00	64.10
360	Indonesia	48	4.17	5.23	3494.60	118.00	32.00	73.90
364	Iran	59	3.67	5.36	13400.00	133.00	28.00	45.70
372	Ireland	35	4.30	4.02	48423.21	25.00	69.00	87.10
376	Israel	81	4.01	4.38	31282.27	39.00	60.00	83.60
380	Italy	75	3.79	4.47	36102.86	72.00	42.00	87.10
392	Japan	92	4.07	4.33	45902.67	17.00	74.00	81.80
414	Kuwait	80	4.21	4.77	62664.10	66.00	44.00	81.60
458	Malaysia	36	4.78	4.88	9977.32	54.00	49.00	78.80
484	Mexico	82	4.18	5.26	10047.13	105.00	34.00	72.90
504	Morocco	68	3.65	5.32	3053.53	88.00	37.00	75.70
528	Netherlands	53	4.70	3.24	50076.28	9.00	84.00	87.10
54	New Zealand	49	4.75	4.10	36253.92	1.00	90.00	86.80
566	Nigeria	55	4.29	5.60	1501.72	139.00	27.00	63.90
608	Philippines	44	3.89	5.14	2369.52	105.00	34.00	75.50
616	Poland	93	3.62	4.71	13462.85	41.00	58.00	87.10
620	Portugal	104	3.91	4.43	22315.84	33.00	63.00	87.10
643	Russia	95	2.88	5.07	13089.34	133.00	28.00	68.20
702	Singapore	8	5.31	4.22	46241.02	5.00	87.00	90.00
705	Slovenia	88	3.78	4.99	24141.94	37.00	61.00	87.10
710	South Africa	49	4.34	4.73	8070.03	69.00	43.00	76.30
410	South Korea	85	3.55	4.67	22424.06	45.00	56.00	72.60
724	Spain	86	3.97	4.76	31942.94	30.00	65.00	87.10
752	Sweden	29	5.32	3.60	57091.05	4.00	88.00	87.10
756	Switzerland	56	5.18	3.50	83382.82	6.00	86.00	90.00
158	Taiwan	69	4.34	5.31	38300.00	37.00	61.00	85.00
764	Thailand	64	3.93	5.61	4972.37	88.00	37.00	75.20
792	Turkey	85	3.63	4.67	10524.00	54.00	49.00	85.40
840	United States	46	4.15	4.00	48111.97	19.00	73.00	86.40
862	Venezuela	76	3.44	5.26	10809.56	165.00	19.00	58.80
716	Zimbabwe	49	4.15	4.73	757.09	163.00	20.00	50.40

The Cost of Culture: The Effect of National Culture and the Pass-Through of Commodity Price Shocks
Senior Capstone Project for Christine Gerrity

Appendix C: Preliminary Regression Analysis

Regression Analysis Tables by Dependent Variable
Dependent Variable: Return
p-values of independent variables from multiple regression analysis

Statistical Significance Across Supply Chains											
Variables	**Coffee**		**Cotton**			**Steel**					
SIC Code	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0.4945	0.2905	0.7611	0.2196	0.6064	0.4984	<.0001	<.0001	0.1480	0.8263	0.0079
Uncertainty Avoidance	0.8255	0.5202	0.7853	0.7920	0.7829	0.1662	0.8720	0.8821	0.2980	0.3920	0.9488
GDP per capita	0.7544	0.4766	0.4567	0.1958	0.5591	**0.0262****	0.7812	0.7642	0.8690	0.7749	0.9906
Corruption Rank	0.5545	0.3437	0.4804	0.5647	0.5045	0.6636	**0.0013****	**0.0034****	0.5293	0.9337	0.1499
Economic Freedom: Trade	0.5087	0.3373	_	-	0.6422	0.4079	**<.0001****	**<.0001****	0.1749	0.8728	**0.0098****
Long-term Debt	0.1873	0.9555	0.1599	0.9637	0.0631	0.4837	**0.0114****	**0.0227****	**0.0233****	**<.0001****	0.9329
EBITDA_SA	0.3869	0.8993	0.1184	0.2763	0.4036	0.9653	0.8770	0.6085	0.5099	0.2569	0.8294
Commodity Shock	0.4940	0.4780	0.2381	0.4836	0.1527	0.8853	0.5281	0.7522	0.7448	**0.0065****	0.9219
Model Significance	0.7316	0.8812	0.1914	0.4653	0.4140	0.4146	**<.0001****	**<.0001****	**0.0495****	**<.0001****	0.2162
R-Square	0.0381	0.0801	0.3857	0.5038	0.0218	0.1080	0.0363	0.0364	0.0346	0.2379	0.002
Number of Observations	119	42	23	107	329	68	1745	1239	406	155	4742

**denotes statistical significance at 95% confidence level

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap
p-values of independent variables from multiple regression analysis

Statistical Significance Across Supply Chains											
Variables	**Coffee**		**Cotton**			**Steel**					
SIC Codes	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0.3969	<.0001	0.7395	0.6128	0.0381	0.8035	0.0277	0.2035	0.8386	0.683	0.959
Uncertainty Avoidance	**0.0052****	**<.0001****	0.9710	0.8744	**0.0003****	0.1460	**0.0374****	0.1011	0.9637	0.5435	0.1542
GDP per capita	0.0836	**0.0339****	0.9481	0.6107	0.5956	**0.0055****	**<.0001****	0.7520	0.0572	0.3280	0.2777
Corruption Rank	**0.0050****	0.2141	0.7568	0.9837	0.9163	0.1922	0.6478	0.4870	0.9950	0.8532	0.422
Economic Freedom: Trade	0.5294	**<.0001****	_	-	0.1095	0.1424	0.0524	0.9294	0.3726	0.9623	0.8817
Long-term Debt	0.2876	0.2798	0.7873	0.7816	**0.0049****	0.3745	**<.0001****	**<.0001****	0.0762	0.1134	0.5193
EBITDA_SA	**<.0001****	0.1943	0.8209	0.7093	**0.0016****	**0.0012****	**<.0001****	**<.0001****	**0.0053****	0.2516	**<.0001****
Commodity Shock	0.7688	0.6536	0.6678	0.6040	**0.0053****	**0.0043****	0.0032	**<.0001****	**0.0037****	0.4946	0.2109
Model Significance	**<.0001****	**<.0001****	0.9817	0.9738	**<.0001****	**<.0001****	**<.0001****	**<.0001****	**0.0008****	0.1881	**<.0001****
R-Square	0.5065	0.7412	0.0535	0.0112	0.1067	0.5314	0.0790	0.0882	0.0596	0.0643	0.0159
Number of Observations	128	43	25	117	339	69	1807	1274	411	156	5032

**denotes statistical significance at 95% confidence level

Regression Analysis Tables by Dependent Variable
Dependent Variable: Marketcap Delta
p-values of independent variables from multiple regression analysis

Statistical Significance Across Supply Chains											
Variables	Coffee		Cotton			Steel					
SIC Codes	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0.8703	0.2877	0.7080	0.5708	0.7794	0.5798	<.0001	<.0001	0.0485	0.7184	0.8979
Uncertainty Avoidance	0.6742	0.3846	0.5967	0.9946	0.6015	0.0982	0.1820	0.1749	0.5485	0.4001	0.8526
GDP per capita	0.8566	0.5554	0.2344	0.5420	0.2372	0.0102**	0.1307	0.3749	0.8324	0.6042	0.4991
Corruption Rank	0.6802	0.3684	0.3179	0.8476	0.4222	0.4893	<.0001**	<.0001**	0.3866	0.9390	0.7750
Economic Freedom: Trade	0.7760	0.3342	_	-	0.8492	0.4421	<.0001**	<.0001**	0.0531	0.7808	0.8246
Long-term Debt	**0.0083****	0.9009	0.0560	0.5670	0.0709	0.5668	<.0001**	0.0001**	0.0190**	<.0001**	0.7835
EBITDA_SA	0.8393	0.8890	0.7952	0.2733	0.1776	0.5626	0.9950	0.8250	0.5135	0.2422	**<.0001****
Commodity Shock	0.7897	0.5284	0.5179	0.9085	0.4207	0.9801	0.3104	0.8672	0.4831	**0.0095****	0.58946
Model Significance	0.2416	0.8999	0.3697	0.6759	0.3598	0.2419	**<.0001****	**<.0001****	**0.0044****	**<.0001****	**0.0008****
R-Square	0.0775	0.0748	0.305	0.0385	0.0232	0.1363	0.0697	0.0706	0.0502	0.2523	0.0052
Number of Observations	119	42	23	107	333	68	1747	1240	406	153	4777

**denotes statistical significance at 95% confidence level

Regression Analysis Tables by Dependent Variable
Dependent Variable: Profit
p-values of independent variables from multiple regression analysis

Statistical Significance Across Supply Chains											
Variables	Coffee		Cotton			Steel					
SIC Codes	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0.1708	0.3773	0.6505	0.2405	0.0094	0.4586	0.9864	0.6149	0.4025	0.7688	0.9974
Uncertainty Avoidance	0.5445	**0.0121****	0.9075	0.0844	**0.0023****	0.8899	0.1742	0.4876	0.9973	0.3936	0.5959
GDP per capita	0.4094	0.2150	0.6654	0.5588	0.1110	0.2725	0.0556	0.8137	0.5055	0.3864	**0.0174****
Corruption Rank	0.5899	0.7341	0.7894	0.0812	**0.0003****	0.7617	0.8426	0.7522	0.4980	0.8592	0.2344
Economic Freedom: Trade	0.6464	0.1764	_	-	0.3216	0.2254	0.9153	0.5400	0.2049	0.6436	0.7676
Long-term Debt	0.1498	**0.0005****	0.9666	0.2697	0.2163	0.2954	**0.0258****	0.6638	0.2095	0.4219	0.3568
EBITDA_SA	**0.0029****	**<.0001****	0.2040	**<.0001****	0.1075	0.1936	**0.0095****	**<.0001****	**<.0001****	**<.0001****	**<.0001****
Commodity Shock	0.7160	0.7901	0.6023	**0.0298****	0.9110	0.7748	0.7009	0.9568	0.6110	0.1959	0.5243
Model Significance	0.0257	**<.0001****	0.8492	**<.0001****	0.0019	**0.0128****	**0.0002****	**<.0001****	**<.0001****	**<.0001****	**<.0001****
R-Square	0.1087	0.7731	0.1146	0.8185	0.0647	0.2323	0.0146	0.1527	0.7494	0.215	0.148
Number of Observations	144	43	27	146	346	71	1949	1356	432	169	5426

**denotes statistical significance at 95% confidence level

Within the following tables, zero is representative of no statistically significant relationship between the independent and dependent variable. Positive signs are indicative of a positive relationship between the independent variables and negative signs indicate an inverse relationship.

Regression Analysis Tables by Dependent Variable
Dependent Variable: Return

Variable Importance on Return											
Variables	**Coffee**		**Cotton**			**Steel**					
SIC Code	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0	0	0	0	0	0	+	+	0	0	+
Uncertainty Avoidance	0	0	0	0	0	0	0	0	0	0	0
GDP per capita	0	0	0	0	0	-	0	0	0	0	0
Corruption Rank	0	0	0	0	0	0	-	-	0	0	0
Economic Freedom: Trade	0	0	0	0	0	0	-	-	0	0	-
Long-term Debt	0	0	0	0	-	0	+	+	+	-	0
EBITDA_SA	0	0	0	0	0	0	0	0	0	0	0
Commodity Shock	0	0	0	0	0	0	0	0	0	+	0
Model Significance	0.7316	0.8812	0.1914	0.4653	0.4140	0.4146	<.0001**	<.0001**	0.0495**	<.0001**	0.2162
R-Square	0.0381	0.0801	0.3857	0.5038	0.0218	0.1080	0.0363	0.0364	0.0346	0.2379	0.002
Number of Observations	119	42	23	107	329	68	1745	1239	406	155	4742

**denotes statistical significance at 95% confidence level

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap

Variable Importance											
Variables	**Coffee**		**Cotton**			**Steel**					
SIC Codes	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0	+	0	0	+	0	+	0	0	0	0
Uncertainty Avoidance	-	-	0	0	-	0	-	0	0	0	0
GDP per capita	0	+	0	0	0	-	+	0	0	0	0
Corruption Rank	+	0	0	0	0	0	0	0	0	0	0
Economic Freedom: Trade	0	-	N/A	N/A	0	0	0	0	0	0	0
Long-term Debt	0	0	0	0	+	0	-	-	0	0	0
EBITDA_SA	-	0	0	0	+	+	-	-	+	0	-
Commodity Shock	0	0	0	0	+	+	+	+	+	0	0
Model Significance	<.0001**	<.0001**	0.9817	0.9738	<.0001**	<.0001**	<.0001**	<.0001**	0.0008**	0.1881	<.0001**
R-Square	0.5065	0.7412	0.0535	0.0112	0.1067	0.5314	0.0790	0.0882	0.0596	0.0643	0.0159
Number of Observations	128	43	25	117	339	69	1807	1274	411	156	5032

**denotes statistical significance at 95% confidence level

Regression Analysis Tables by Dependent Variable
Dependent Variable: Marketcap Delta

Variable Importance											
Variables	Coffee		Cotton			Steel					
SIC Codes	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0	0	0	0	0	0	+	+	+	0	0
Uncertainty Avoidance	0	0	0	0	0	0	0	0	0	0	0
GDP per capita	0	0	0	0	0	-	0	0	0	0	0
Corruption Rank	0	0	0	0	0	0	-	-	0	0	0
Economic Freedom: Trade	0	0	N/A	N/A	0	0	-	-	0	0	0
Long-term Debt	+	0	0	0	-	0	+	+	+	-	0
EBITDA_SA	0	0	0	0	0	0	0	0	0	0	-
Commodity Shock	0	0	0	0	0	0	0	0	0	+	0
Model Significance	0.2416	0.8999	0.3697	0.6759	0.3598	0.2419	<.0001**	<.0001**	0.0044**	<.0001**	0.0008**
R-Square	0.0775	0.0748	0.305	0.0385	0.0232	0.1363	0.0697	0.0706	0.0502	0.2523	0.0052
Number of Observations	119	42	23	107	333	68	1747	1240	406	153	4777

**denotes statistical significance at 95% confidence level

Regression Analysis Tables by Dependent Variable
Dependent Variable: Profit

Variable Importance											
Variables	Coffee		Cotton			Steel					
SIC Codes	2095	5812	2211	2281	5600	3325	3341	3312	3316	3317	3500
Intercept	0	0	0	0	+	0	0	0	0	0	0
Uncertainty Avoidance	0	+	0	-	+	0	0	0	0	0	0
GDP per capita	0	0	0	-	0	0	0	0	0	0	+
Corruption Rank	0	0	0	+	-	0	0	0	0	0	0
Economic Freedom: Trade	0	0	N/A	N/A	0	0	0	0	0	0	0
Long-term Debt	0	+	0	0	0	0	-	0	0	0	0
EBITDA_SA	+	-	0	+	0	0	+	+	+	+	+
Commodity Shock	0	0	0	+	0	0	0	0	0	0	0
Model Significance	0.0257	<.0001**	0.8492	<.0001**	0.0019	0.0128**	0.0002**	<.0001**	<.0001**	<.0001**	<.0001**
R-Square	0.1087	0.7731	0.1146	0.8185	0.0647	0.2323	0.0146	0.1527	0.7494	0.215	0.148
Number of Observations	144	43	27	146	346	71	1949	1356	432	169	5426

**denotes statistical significance at 95% confidence level

Appendix D: Steel Regression Analysis

Low Uncertainty Avoidance:

Within the following tables, zero is representative of no statistically significant relationship between the independent and dependent variable. Positive signs are indicative of a positive relationship between the independent variables and negative signs indicate an inverse relationship.

Regression Analysis Tables by Dependent Variable
Dependent Variable:Return

Variable Importance on Return						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	0	0	0	0	+
GDP per capita	0	0	0	0	+	0
Corruption Rank	0	0	0	0	0	0
Economic Freedom: Trade	N/A	-	-	0	0	-
Long-term Debt	0	+	+	0	-	0
EBITDA_SA	0	0	0	0	-	0
Commodity Shock	0	0	0	0	0	0
Model Significance	<.4706	<.0001	<.0001	0.1677	<.0001	0.3654
R-Square	0.2308	0.0558	0.0663	0.0540	0.5739	0.0034
Number of Observations	22	714	544	169	68	1942

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap

Variable Importance on Market Capitalization- Low UAI						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	0	0	+	0	-
GDP per capita	+	+	+	+	0	+
Corruption Rank	0	+	+	+	0	+
Economic Freedom: Trade	N/A	0	0	-	0	+
Long-term Debt	0	-	-	0	-	+
EBITDA_SA	+	0	0	0	0	-
Commodity Shock	0	+	0	0	0	+
Model Significance	<.0001	<.0001	<.0001	0.0052	0.1737	<.0001
R-Square	0.7529	0.0786	0.0738	0.1051	0.1332	0.1358
Number of Observations	23	745	561	171	68	2073

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap Delta

Variable Importance on Market Capitalization Delta						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	0	0	0	0	+
GDP per capita	0	0	0	0	+	0
Corruption Rank	0	0	0	0	0	0
Economic Freedom: Trade	N/A	0	0	0	0	-
Long-term Debt	0	+	+	0	-	0
EBITDA_SA	0	0	0	0	-	0
Commodity Shock	0	0	0	0	0	0
Model Significance	0.3616	<.0001	<.0001	0.0866	<.0001	<.0001
R-Square	0.2695	0.0775	0.0822	0.0652	0.5916	0.0158
Number of Observations	22	714	544	169	68	1941

Regression Analysis Tables by Dependent Variable
Dependent Variable: Profit

Variable Importance on Profit						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	0	0	0	0	0
GDP per capita	0	-	0	0	0	-
Corruption Rank	0	0	0	0	0	0
Economic Freedom: Trade	N/A	+	0	0	0	0
Long-term Debt	0	0	0	0	0	0
EBITDA_SA	0	+	+	+	+	+
Commodity Shock	0	0	0	0	0	0
Model Significance	0.1069	<.0001	<.0001	<.0001	<.0001	<.0001
R-Square	0.3324	0.1198	0.5876	0.7241	0.3605	0.6925
Number of Observations	27	794	596	181	73	2251

High Uncertainty Avoidance:

Within the following tables, zero is representative of no statistically significant relationship between the independent and dependent variable. Positive signs are indicative of a positive relationship between the independent variables and negative signs indicate an inverse relationship.

Regression Analysis Tables by Dependent Variable
Dependent Variable:Return

Variable Importance on Return						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	+	+	+	0	+
GDP per capita	0	-	-	0	0	0
Corruption Rank	0	-	-	0	0	0
Economic Freedom: Trade	0	-	-	-	0	-
Long-term Debt	0	0	0	0	0	0
EBITDA_SA	0	0	0	-	0	0
Commodity Shock	0	0	0	+	0	0
Model Significance	0.0369	<.0001	<.0001	<.0001	0.7543	0.3767
R-Square	0.5624	0.1219	0.1146	0.2613	0.0618	0.0045
Number of Observations	19	719	491	179	46	1419

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap

Variable Importance on Market Capitalization						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	0	+	0	-	-
GDP per capita	0	+	-	-	+	0
Corruption Rank	0	0	-	-	+	+
Economic Freedom: Trade	N/A	0	0	0	N/A	+
Long-term Debt	0	-	-	-	-	+
EBITDA_SA	0	-	-	+	0	+
Commodity Shock	0	+	+	+	0	0
Model Significance	0.5127	<.0001	<.0001	<.0001	<.0001	<.0001
R-Square	0.2560	0.1554	0.2397	0.2833	0.7465	0.3707
Number of Observations	19	730	497	179	44	1451

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap Delta

Variable Importance on Market Capitalization Delts						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	+	+	0	0	0
GDP per capita	0	-	-	0	0	0
Corruption Rank	0	-	-	0	0	0
Economic Freedom: Trade	N/A	-	-	0	N/A	0
Long-term Debt	0	0	0	0	0	0
EBITDA_SA	0	0	0	-	0	0
Commodity Shock	0	0	0	+	0	0
Model Significance	0.0330	<.0001	<.0001	<.0001	0.6932	0.9631
R-Square	0.5710	0.1367	0.1299	0.1773	0.0742	0.001
Number of Observations	19	721	493	179	44	1425

Regression Analysis Tables by Dependent Variable
Dependent Variable: Profit

Variable Importance on Profit						
Variables	**Steel**					
SIC Codes	**3325**	**3341**	**3312**	**3316**	**3317**	**3500**
Intercept	0	0	0	0	0	-
GDP per capita	0	0	0	+	0	+
Corruption Rank	0	0	0	0	0	0
Economic Freedom: Trade	N/A	0	0	0	N/A	+
Long-term Debt	0	0	0	-	0	0
EBITDA_SA	+	0	+	+	0	0
Commodity Shock	0	0	0	0	0	0
Model Significance	<.0001	0.0841	<.0001	<.0001	0.3900	<.0001
R-Square	0.9237	0.0142	0.1468	0.9092	0.1131	0.0978
Number of Observations	19	783	520	184	48	1508

Appendix E: Commodity Regression Analysis

Low Uncertainty Avoidance:

Within the following tables, zero is representative of no statistically significant relationship between the independent and dependent variable. Positive signs are indicative of a positive relationship between the independent variables and negative signs indicate an inverse relationship.

Regression Analysis Tables by Dependent Variable

Dependent Variable: Return

Variable Importance on Return			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	+
GDP per capita	0	0	0
Corruption Rank	0	0	-
Economic Freedom: Trade	0	0	-
Long-term Debt	0	0	0
EBITDA_SA	0	0	0
Commodity Shock	0	0	0
Model Significance	0.4995	0.0816	<.0001
R-Square	0.0397	0.0586	0.012
Number of Observations	137	191	5604

Regression Analysis Tables by Dependent Variable

Dependent Variable: Market Cap

Variable Importance on Market Capitalization			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	+
GDP per capita	0	0	0
Corruption Rank	0	0	0
Economic Freedom: Trade	0	0	-
Long-term Debt	0	0	0
EBITDA_SA	0	0	-
Commodity Shock	0	0	0
Model Significance	0.4995	0.7999	<.0001
R-Square	0.0453	0.0154	0.0589
Number of Observations	147	203	5839

Regression Analysis Tables by Dependent Variable

Dependent Variable: Market Cap Delta

Variable Importance on Market Capitalization Delta			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	+
GDP per capita	0	0	0
Corruption Rank	0	0	-
Economic Freedom: Trade	0	0	-
Long-term Debt	+	0	0
EBITDA_SA	0	0	0
Commodity Shock	0	0	0
Model Significance	0.1504	0.2304	<.0001
R-Square	0.069	0.0427	0.0278
Number of Observations	137	191	5604

Regression Analysis Tables by Dependent Variable

Dependent Variable: Profit

Variable Importance on Profit			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	0
GDP per capita	0	0	+
Corruption Rank	0	0	0
Economic Freedom: Trade	0	0	0
Long-term Debt	0	0	0
EBITDA_SA	+	+	+
Commodity Shock	0	+	0
Model Significance	0.2369	<.0001	<.0001
R-Square	0.0495	0.6259	0.2054
Number of Observations	163	236	6285

High Uncertainty Avoidance:

Within the following tables, zero is representative of no statistically significant relationship between the independent and dependent variable. Positive signs are indicative of a positive relationship between the independent variables and negative signs indicate an inverse relationship.

Regression Analysis Tables by Dependent Variable
Dependent Variable: Return

Variable Importance on Return			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	+
GDP per capita	0	0	0
Corruption Rank	0	0	-
Economic Freedom: Trade	0	0	-
Long-term Debt	0	0	+
EBITDA_SA	0	0	0
Commodity Shock	0	0	0
Model Significance	0.4946	0.0692	<.0001
R-Square	0.0368	0.0594	0.0224
Number of Observations	149	196	5081

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap

Variable Importance on Market Capitalization			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	0
GDP per capita	0	0	+
Corruption Rank	0	0	0
Economic Freedom: Trade	0	0	0
Long-term Debt	0	0	0
EBITDA_SA	0	0	-
Commodity Shock	0	0	+
Model Significance	0.4782	0.8201	<.0001
R-Square	0.0392	0.014	0.0393
Number of Observations	147	211	5217

Regression Analysis Tables by Dependent Variable
Dependent Variable: Market Cap Delta

Variable Importance on Market Capitalization Delta			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	0	0	+
GDP per capita	0	0	0
Corruption Rank	0	0	-
Economic Freedom: Trade	0	0	-
Long-term Debt	+	0	+
EBITDA_SA	0	0	0
Commodity Shock	0	0	0
Model Significance	0.1664	0.1952	<.0001
R-Square	0.0614	0.0438	0.0302
Number of Observations	149	198	5088

Regression Analysis Tables by Dependent Variable
Dependent Variable: Profit

Variable Importance on Profit			
Variables	**Coffee**	**Cotton**	**Steel**
Intercept	+	0	0
GDP per capita	0	+	+
Corruption Rank	0	0	0
Economic Freedom: Trade	0	0	0
Long-term Debt	0	0	-
EBITDA_SA	0	+	+
Commodity Shock	0	+	0
Model Significance	0.818	<.0001	<.0001
R-Square	0.0172	0.6442	0.0199
Number of Observations	174	242	5542

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