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Individualism and sensitivity of investment to stock prices: Evidence from emerging markets

Abstract

Chui et al. (2010) argue that cultures with high levels of individualism are defined by overconfidence and self-attribution bias. Markus and Kitayama (1991) and Heine et al. (1999) note that these biases lead to less efficient stock prices with excess volatility. Foucault and Frésard (2012) show that sensitivity of investment to stock prices is an increasing function of informativeness of stock prices. They argue that sensitivity of investment to stock prices increase because value-maximizing managers are forced to use all available information to forecast the cash flows of their capital allocation decisions. They argue that information revealed via informative stock prices is new to value maximizing managers. Consequently, these managers incorporate this information in their analysis, thereby increasing sensitivity of investment to informative stock prices. This paper argues that individualism, being a significant determinant of information content in stock prices, can also affect sensitivity of investment to stock prices. Using data from 37 emerging markets, our results show that individualism significantly reduces sensitivity of investment to stock prices during the period between 2008 and 2014. Our results are robust to alternate estimation procedures. Our results also indicate that the effect of individualism on sensitivity of investment to stock prices is more pronounced when investment expenditures are large. Moreover, we also show that the impact of individualism on the sensitivity of investment to stock prices is moderated by the institutional, social, and cultural environment of the country.

JEL Classification: G14; G15; G31

Keywords: Individualism; National Cultures; Capital Expenditures; Sensitivity of Investment to Stock Prices; Emerging Markets.

1. Introduction

Anecdotal evidence suggests that individualism affects informativeness of stock prices by influencing country's information environment and investors' trading behaviors. Chui et al. (2010), for example, argue that cultures with high levels of individualism are defined by overconfidence and self-attribution bias. Markus and Kitayama (1991) and Heine et al. (1999) note that these biases lead to less efficient stock prices with excess volatility. Given significant impact of individualism on informativeness of stock prices, it is very much possible that it also affects sensitivity of investment to stock prices. Our argument is consistent with Foucault and Frésard (2012) who show that sensitivity of investment to stock prices is an increasing function of informativeness of stock prices. They document that sensitivity of investment to stock prices increases as stock prices become more informative. They argue that sensitivity of investment to stock prices increases because value-maximizing managers are forced to use all available information to forecast the cash flows of their capital allocation decisions. Their forecasts depend not only on their own private information but also on stock prices because informative stock prices reflect private information of informed investors. They argue that information revealed via informative stock prices is new to value maximizing managers. Consequently, these managers incorporate this information in their analysis, thereby increasing sensitivity of investment to informative stock prices. This paper argues that individualism, being a significant determinant of information content in stock prices, can also affect sensitivity of investment to stock prices.

Consistent with our arguments, this paper documents that sensitivity of investment to stock prices is affected by individualism. Using data from 37 emerging markets, our results show that individualism significantly reduces sensitivity of investment to stock prices during the period between 2008 and 2014. Consistent with prior literature, we argue that managers in individualistic cultures overestimate their abilities (Markus and Kitayama, 1991; Heine et al., 1999). Therefore, they are more likely to overweight their own information and give less than optimal weight to information revealed via stock prices in their investment decisions. As a result, sensitivity of investment to stock prices weakens in individualistic cultures. Our results are robust to alternate estimation procedures. Our results also indicate that the effect of individualism on sensitivity of investment to stock prices is more pronounced when

investment expenditures are large. Our analysis from quantile regression shows that the impact of individualism on sensitivity of investment to stock prices is high at higher points of conditional distribution of investment expenditures.

Small investment expenditure carry less consequential outcomes compared to higher levels of expenditure since the larger the investment the riskier it becomes (Sanders and Hambrick, 2007). As a result of the risk associated with high levels of investment expenditure, it takes several stages for a firm to take the decision to make such large expenditure (Crundwell, 2008). This further accentuate the effect of culture on investment expenditure since it gets accumulated throughout the decision makers.

Furthermore, our results also show that institutional environment at the country level has significant implications for the impact of individualism on sensitivity of investment to stock prices. We show that sensitivity of investment to stock prices is stronger in countries where individualism is complemented by stronger institutional environment than in countries where individualism is accompanied by weaker institutional infrastructure. We argue that stock prices in countries with strong institutions are more informative and higher information content in stock prices make any behavioral biases that may exist due to individualism less pronounced (Ackert and Athanassakos, 1997).

We also show that the impact of individualism on the sensitivity of investment to stock prices is moderated by the social and cultural environment of the country. The countries with more heterogeneous societies (ethnic fractionalization and linguistic fractionalization) tend to increase the negative impact of individualism on sensitivity of investment to stock prices than other countries. We argue that heterogeneity lowers the information content in stock prices by affecting the quality of institutions. Given the relatively more inefficient stock prices, individualism reduces sensitivity of investment to stock prices in societies with higher heterogeneity. Furthermore, we also show that the negative impact of individualism on sensitivity of investment to stock prices is more pronounced in countries with high power distance than in countries with low power distance. In case of uncertainty avoidance and masculinity, our results show that sensitivity of investment to stock prices is stronger in cultures where individualism is complemented by high uncertainty avoidance or high masculinity than in cultures where individualism is

accompanied by low uncertainty avoidance or low masculinity. Countries with high power distance have inadequate disclosure since they have cultures that discourage information sharing (Zarzeski, 1996). This results in less informative stock prices and therefore lower sensitivity of investment to stock prices in individualistic cultures with high power distance. Regarding masculinity, firms with high masculinity are more transparent when reporting information and have stricter protection of shareholders' rights (de Jong and Semenov, 2002; Gray et al., 2012). This results in higher sensitivity of investment to stock prices in individualistic cultures with high masculinity. Moreover, cultures with high uncertainty avoidance are characterized by carefully planning and implementing rules and regulations resulting in high information content in stock prices (Amirhosseini, 2012). Accordingly, higher sensitivity of investment to stock prices in individualistic cultures occurs when it is complemented with high uncertainty avoidance.

The remainder of the paper is structured as follows: Section 2 documents motivation and background for this paper. Section 3 summarizes the data. Section 4 presents assessment of our hypothesis. Section 5 presents additional tests, while Section 6 discusses our results. The paper ends with Section 7 where we present conclusions.

2. Motivation and background

Information is the key to efficient functioning of the stock markets. Securities get priced correctly when all relevant information about firms enters the market. Stock market agents, such as investors and analysts, play an important role in this process by bringing out new information. Information brought out by the stock market agents is aggregated via trading process and is transmitted through prices (Grossman and Stiglitz, 1980; Glosten and Milgrom, 1985; Kyle, 1985). Prior literature argues that information conveyed via stock prices has remarkable ability to accurately forecast predictions about real outcomes (Roll, 1984). Wolfers and Zitzewitz (2004) note that stock market predictions are better than predictions made by polls and other devices.

Given significant ability of stock prices to reveal value-relevant information, managers have used them to learn about the future prospects of their firms. Prior literature argues that stock prices help managers find out what stock market participants think about

their firms (Dow and Gorton, 1997; Subrahmanyam and Titman, 1999). For some stock market participants, the only channel available to communicate their information to firms is the stock prices. Stock prices, therefore, contain information that is not known to managers. An example of this is the information about demand of firm's products or information about competition with other firms. Foucault and Frésard (2012) argue that managers use information conveyed via stock prices in making decisions on corporate investments. They show that sensitivity of corporate investment to stock price increases as the amount of information in stock prices increase. They argue that investment sensitivity to stock prices increase because value maximizing managers are forced to use information transmitted via stock prices to forecast cash flows of their capital allocation decisions. Their forecasts depend not only on their own information but also on information conveyed via stock prices (because stock prices reflect information that is not known to them). They argue that value maximizing managers are inclined to use this information to improve their investment decisions. It, therefore, leads to higher sensitivity of investment to stock prices. In another related study, Chen et al. (2007) also come to same conclusion by showing that investment sensitivity to stock prices is an increasing function of informativeness of stock prices.

In this paper, we posit that validity of above arguments – sensitivity of investment to stock prices – is conditional upon the cultural traits of the country. An important cultural characteristic that can affect sensitivity of investment to stock prices is the degree of individualism in a country. Individualism refers to the extent to which people hold an independent rather than an interdependent self-image. It measures the extent to which people are integrated into groups and reflects the degree to which they focus on their unique internal attributes to differentiate themselves from others (Baumeister, 1999). Markus and Kitayama (1991) argue that people in individualist cultures take decisions “by reference to one's own internal repertoire of thoughts, feelings, and action, rather than by reference to the thoughts, feelings, and actions of others”. Unlike people in individualist cultures, people in collectivist cultures address problems by including all contributing entities of a certain situation rather than focusing on a single individual (Markus and Kitayama, 1991). Zhan (2013) argues that collectivism is manifested in imitation of

decisions of others since people in that culture value “conformity to others” and “harmony”, unlike people in individualist cultures who are independent and self-reliant.

We argue that individualism influences sensitivity of investment to stock prices via number of channels:

- First, individualism affects the information transmission capacity of stock prices. Prior literature argues that individualistic cultures are characterized by certain biases that can lead to stock prices that may convey less than optimal information about fundamental values. Markus and Kitayama (1991) and Heine et al. (1999), for example, note that people in individualistic cultures overestimate their abilities. These cultures are, therefore, characterized by overconfidence and self-attribution bias (Markus and Kitayama, 1991; Kagitcibasi, 1997; Bank and Brustabauer, 2014). Chui et al. (2010) argue that overconfidence and self-attribution bias in individualistic cultures translate into higher volatility of stock prices. Beckmann et al. (2008) note that overconfidence associated with individualistic cultures lead investors to analyze information on their own and be less concerned about opinions of the others. As a result, individualistic cultures are marked by greater dispersion in investor’s opinion about fundamental values. It may, therefore, lower the informativeness of stock prices.
- Second, self-attribution bias prevalent in individualistic cultures causes investors to underweight public signals. Therefore, a typical investor in an individualist society would invest in a firm depending only on his private information and his self-confidence. His decision will not be affected if it contradicts with what the public information shows. Jessop et al. (2015) argue that investors in individualistic societies believe in the accuracy of, and consequently depends on, their private information while taking investment decisions while underestimating public information.

Therefore, we posit that managers from individualistic cultures are less likely to use information revealed via stock prices in their investment decisions, thereby decreasing the sensitivity of investment to stock prices. Our arguments is consistent with Daniel et al. (1998) who argue that overconfidence leads investors to overweight the precision of their private signals, and self-attribution bias causes them to underweight public signals about a stock’s value. Furthermore, we also argue that higher stock market volatilities in

individualistic cultures make stock prices less informative. As a result, we should expect reduction in sensitivity of investment to stock prices.

3. Data

This paper documents the effect of individualism on the sensitivity of investment to stock prices in emerging markets during the period between 2008 and 2014. For the purpose of this study, our sample consists of non-financial firms listed in Argentina, Bangladesh, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Egypt, Ghana, Greece, Hungary, India, Indonesia, Israel, Jordan, Kuwait, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, South Africa, South Korea, Sri Lanka, Taiwan, Thailand, Turkey, UAE, Venezuela, and Vietnam. The following sub-sections will explain data in greater details.

3.1 Dependent variable: Investment

Investment (CAPEX) is a measure of corporate investment in year t . It is measured by the ratio of capital expenditures in that year scaled by lagged book assets (Foucault and Frésard, 2012).

3.2 Independent variables

3.2.1 Individualism

Individualism (IND) measures the extent to which a society stresses the role of a group versus that of an individual. It indicates whether members of a society look only after themselves and their immediate family, or belong to groups which look after them. People in individualist societies have an 'I' consciousness and for them individual interests prevail, while people in collectivist societies have a 'We' consciousness and for them collective interests prevail. Hofstede's individualism index is used to determine the extent of individualism. Table 1 documents the extent of individualism in our sample countries. Our

results indicate that, on average, Latin American countries have the lowest level of individualism, followed by Asian countries, African countries, and European countries.

[Insert Table 1 here]

3.2.2 Stock prices

This paper uses Tobin'Q (Q) as a measure of normalized prices. We compute Q as the market value of equity plus book value of assets minus the book value of equity, scaled by book assets (Foucault and Frésard, 2012).

3.2.3 Control variables

This paper uses four sets of control variables that account for various dimensions of firm-specific characteristics, country-specific institutional environment, social environment, and cultural environment.

- The variables used to capture various aspects of firm-specific characteristics are log of total assets (SIZE), total debt to total asset ratio (LEVERAGE), growth in total assets (GROWTH), earnings per share (EPS), number of analysts covering a firm (ANALYST), and accounting standards followed by a firm (IFRS).
- The variables representing country-specific institutional environment are extent of rule of law (RLAW), degree of investment freedom (FINVEST), and degree of trade freedom (FTRADE).
- Ethnic fractionalization (ETHNIC), religious fractionalization (RELIGIOUS), and linguistic fractionalization (LINGUISTIC) are used to control for various dimensions of country-specific social environment.
- The variables representing country-specific cultural environment are power distance (PDISTANCE), uncertainty avoidance (UAVOIDANCE), and masculinity (MASCULINITY).

4. Methodology

In order to document, the impact of individualism on sensitivity of investment to stock prices, we estimate the following regression equation with capital expenditure (CAPEX) as a dependent variable and Tobin's Q, (Q), individualism (IND), and interaction between Tobin's Q and individualism (Q*IND) as independent variables. As indicated above, we also include above mentioned control variables in the regression equation. For the purpose of completeness, we also include industry dummies (IDUM) and year dummies in our analysis. Our basic regression equation is defined as follows. We estimate various versions of the following equation in this paper. Our estimation is similar in spirit to earlier studies, such as Foucault and Frésard (2012).

$$\begin{aligned} \text{CAPEX}_t = & \alpha + \beta_1(Q_{t-1}) + \beta_2(\text{IND}_{t-1}) + \beta_3(Q_{t-1} * \text{IND}_{t-1}) + \beta_4(\text{SIZE}_{t-1}) \\ & + \beta_5(\text{LEVERAGE}_{t-1}) + \beta_6(\text{GROWTH}_{t-1}) + \beta_7(\text{EPS}_{t-1}) \\ & + \beta_8(\text{ANALYST}_{t-1}) + \beta_9(\text{IFRS}_{t-1}) + \beta_{10}(\text{RLAW}_{t-1}) \\ & + \beta_{11}(\text{FINVEST}_{t-1}) + \beta_{12}(\text{FTRADE}_{t-1}) + \beta_{13}(\text{ETHNIC}_{t-1}) \\ & + \beta_{14}(\text{RELIGIOUS}_{t-1}) + \beta_{15}(\text{LINGUISTIC}_{t-1}) + \beta_{16}(\text{PDISTANCE}_{t-1}) \\ & + \beta_{17}(\text{UAVOIDANCE}_{t-1}) + \beta_{18}(\text{MASCULINITY}_{t-1}) + \sum_{\text{Ind}=1}^N \gamma^{\text{Ind}} (\text{IDUM}) \\ & + \sum_{\text{Yr}=1}^N \theta^{\text{Yr}} (\text{YDUM}) + \varepsilon_t \end{aligned} \quad (1)$$

The results of our analysis are reported in Table 2. Consistent with prior literature, we show significantly positive relationship not only between investment and stock prices but also between investment and individualism (Foucault and Frésard, 2012; Shao et al., 2013). We report significantly positive coefficients for Q and IND for all estimations. Furthermore, consistent with our arguments, this paper also shows that individualism reduces the sensitivity of investment to stock prices. We report significantly negative coefficient of Q*IND for all estimations. We argue that managers in individualistic cultures overestimate their abilities and undervalue the opinion of others (Markus and Kitayama, 1991; Heine et al., 1999; Jureviciene, 2012). Therefore, they are more likely to overweight their own information and give less than optimal weight to public information revealed via stock prices in their investment decisions. As a result, the sensitivity of investment to stock prices weakens in individualistic cultures.

[Insert Table 2 here]

5. Additional tests

5.1 Estimation with clustered standard errors

As an additional test, we compute the standard errors by clustering the observations within each firm. Peterson (2009) considers such clustering as a mechanism to account for serial correlation and heteroskedasticity. Our unreported results show that significance of variables remains qualitatively the same.

5.2 Estimation with quantile regression

Our analysis implies that no matter what point on the conditional distribution is analyzed, the impact of individualism on the sensitivity of investment to stock prices remains the same. This may not be the true reflection of this relationship. We argue that qualitative factors, such as cultural characteristics, are more important in determining investment decisions when investment expenditures are large. For smaller investment expenditures, cultural characteristics may not be very important. Small investment expenditure carry less consequential outcomes compared to higher levels of expenditure since the larger the investment the riskier it becomes (Sanders and Hambrick, 2007). As a result of the risk associated with high levels of investment expenditure, it takes several stages for a firm to take the decision to make such large expenditure; the investment has to be approved by the division then the corporate investment committee, and finally the CEO and the board of directors (Crundwell, 2008). It can be deducted that these various stages further accentuate the effect of the dominant culture on investment expenditure since the effect will be accumulated throughout the stages. Moreover, value maximizing managers will not take much time and effort to incorporate sources of information, like stock prices, to take small investment decisions as opposed to larger risky ones. Regarding individualism, the higher the level of individualism in a culture the more corporate risk taking is encouraged (Rehbein, 2014). Accordingly, at higher levels of risk, individualism effect on investment becomes more

material. To test the empirical validity of our argument, we estimate Equation (1) at different points of conditional distribution of investment expenditures. For the purpose of this paper, we use quantile regression to estimate Equation (1) at five quantiles (namely 0.10, 0.30, 0.50, 0.70, and 0.90). The results of our analysis are reported in Table 3. Our results confirm our earlier findings that individualism reduces the sensitivity of investment to stock prices. We report significantly negative coefficient of $Q*IND$ for all quantiles. However, as expected, our results also show that the ability of individualism to reduce sensitivity of investment to stock prices is high when investment expenditures are large. We report consistent increase in the magnitude of the coefficient estimates of $Q*IND$ from 0.10 quantile to 0.90 quantile. This result is also supported by the coefficient estimates of Q and IND . Our results also show consistent increase in the magnitude of the coefficient estimates of Q and IND from 0.10 quantile to 0.90 quantile. It highlights the fact that stock prices and individualism are more important for determining investment expenditures when investment expenditures are large.

[Insert Table 3 here]

5.3 Individualism and sensitivity of investment to stock prices in different sub-samples

There may be concerns that our results are confined to certain stocks. In order to overcome this concern, we divide our sample into two sub-groups. First sub-group comprises of firms with size below the median size of the sample and second sub-group consists of firms with size above the median size of the sample. We re-estimate Equation (1) for both groups. The results of our analysis are reported in Table 4. Our results show that individualism reduces the sensitivity of investment to stock prices in large firms. We report significantly negative coefficient of $Q*IND$ for large firms. However, for small firms, our results show no impact of individualism on the sensitivity of investment to stock prices. We report insignificant coefficient of $Q*IND$ for small firms. This result is consistent with above arguments because smaller firms have low levels of investment expenditures and behavioral biases may be of lesser importance for these expenditures.

[Insert Table 4 here]

6. Discussion of results

We argued in Section 2 that individualistic cultures are characterized by overconfidence and self-attribution bias (Markus and Kitayama, 1991; Kagitcibasi, 1997). These biases lead managers to be less concerned about opinions of the others (Beckmann et al., 2008). Therefore, managers from individualistic cultures are more likely to overweight their private information in investment decisions, thereby weakening the sensitivity of investment to stock prices in these cultures (Daniel et al., 1998). Prior literature, however, also argues that behavioral biases are less pronounced when information asymmetries are low (Ackert and Athanassakos, 1997). Ackert and Athanassakos (1997) show that economic agents tend to be less biased in transparent information environments. Therefore, any factors that can help improve information environment can alter the effect of individualism on the sensitivity of investment to stock prices. In the following sub-sections, we briefly discuss the impact of country-specific institutional environment, social environment, and cultural environment on the relationship between individualism and the sensitivity of investment to stock prices. We consider institutional, social, and cultural factors to be important determinants of the information environment of the country.

6.1 Effect of institutional environment on the relationship between individualism and sensitivity of investment to stock prices

Institutions are defined as the set of informal and formal rules that regulate the interactions in a society (Kunsch et al, 2014). They include behavioral codes of conduct and laws and regulations, means of enforcing these rules, and sanctions for those who fail to abide by them (Assane & Chiang, 2014). A good institution is one that could maximize the productivity of its capital through increasing transparency of information about the market and enforcing property rights and other laws and regulations thus creating a competitive market (Kunsch et al, 2014; Assane & Chiang, 2014). For the purpose of this paper, we use the extent of rule of law (RLAW), the degree of investment freedom (FINVEST), and the degree of trade freedom (FTRADE) as proxies for the strength of country-specific

institutional environment. Prior literature associates these mechanisms with the strength of country-specific institutions to varying degrees (La Porta et al., 1997; **REFERENCE**).

Regarding the rule of law, Oxley and Yeung (2001) defines a strong rule of law as having "sound political institutions, a strong court system, and provisions for orderly succession of power. ...," as well as "... citizens [who] are willing to accept the established institutions and to make and implement laws and adjudicate disputes". Countries with good institutional environment are associated with an enforced strong rule of law (Kunsch et al, 2014). Kunsch et al (2014) add that a country with a strong rule of law signifies an institutional environment that is Legitimate. Furthermore, a strong rule of law reduces the uncertainty around business transactions since each party knows their legal rights, obligations, and consequences (Kunsch et al, 2014).

As for degree of investment freedom, a country with freedom of investment have no constraints on investment capital flow (Hristova, 2012). Some of the most important constraints for freedom of investment are corruption, security problems, weak protection of property rights and lack of regulating rules (Heritage Foundation, 2015; Gwartney et al,2006). All these restrictions are the characteristics of a weak institutional environment. Accordingly, a strong institutional environment promotes investment since it has no investment cash flow constraints and this results in minimizing risk and uncertainty, protecting investors rights, and maximizing returns (Gwartney et al,2006; Mayer et al, 2005).

Regarding degree of trade freedom, Assane & Chiang (2014) states that the correlation between institutional quality and trade is more than that of the geography. The better the institutional quality the more the trade flow while bad institutional quality is associated with restrictions on trade (Dollar, 2002; Assane & Chiang, 2014). Good institutions have a strong legal systems that enforces contracts and ensures transparency which increases predictability, eases transactions , reduces costs, and creates an encouraging trading environment (Anderson and Marcouille, 2002; Fakher, 2014).

Prior literature associates strength of institutional mechanisms at the country level with the informativeness of stock prices. Morck et al. (2000), for instance, argue that strength of country-specific institutional mechanisms promotes informed arbitrage activity based on private information. More demand for private information leads to more informative stock prices. This paper argues that there exists a direct relationship between informativeness of stock prices and the extent of information asymmetries. The more informative are the stock prices, the lower are the information asymmetries. Consequently, behavioral biases that emerge from individualism should be less pronounced in countries with strong institutions.

We, therefore, expect managers from individualistic cultures with strong institutions to use information conveyed via stock prices more in their investment decisions than managers from individualistic cultures with weak institutions. As a result, we should observe higher sensitivity of investment to stock prices in individualistic cultures with strong institutions than in individualistic cultures with weak institutions.

Sub hypothesis 1a: Sensitivity of investment to stock prices is higher in individualistic cultures with higher rule of law than in individualistic cultures with weak rule of law.

Sub hypothesis 1b: Sensitivity of investment to stock prices is higher in individualistic cultures with higher investment freedom than in individualistic cultures with lower investment freedom.

Sub hypothesis 1c: Sensitivity of investment to stock prices is higher in individualistic cultures with higher trade freedom than in individualistic cultures with lower trade freedom.

In order to document the effect of country-specific institutional environment on the relationship between individualism and sensitivity of investment to stock prices, we estimate Equation (1) after introducing one of the following interaction terms in the analysis: $Q*IND*RLAW$, $Q*IND*FINVEST$, and $Q*IND*FTRADE$. The results of our analysis are reported in Table 5. Our results in this table confirm our earlier findings that individualism reduces the sensitivity of investment to stock prices. We report significantly negative coefficient of $Q*IND$ for all estimations. However, as argued, our results also show that the ability of individualism to reduce sensitivity of investment to stock prices is less pronounced when country-specific institutional environment is strong. We report significantly positive coefficient of $Q*IND*RLAW$, $Q*IND*FINVEST$, and $Q*IND*FTRADE$. It indicates that sensitivity of investment to stock prices is higher in those individualistic cultures that have stronger institutional environment than individualistic cultures that have weaker institutional environment.

[Insert Table 5 here]

6.2 Effect of cultural environment on the relationship between individualism and sensitivity of investment to stock prices

This paper also argues that the impact of individualism on sensitivity of investment to stock prices is moderated by the cultural characteristics, such as power distance (PDISTANCE), uncertainty avoidance (UAVOIDANCE), and masculinity (MASCULINITY). Our assertion that cultural characteristics can affect the relationship between individualism and sensitivity of investment to stock prices depends on our understanding that cultural characteristics can affect the information content of stock prices. Zarzeski (1996), for instance, argues that cultures with high power distance are likely to have environments that discourage information sharing. Consequently, financial disclosure may be inadequate, thereby resulting in less informative stock prices. As a result, we expect lower sensitivity of investment to stock prices in individualistic cultures with high power distance than individualistic cultures with low power distance. Similarly, de Jong and Semenov (2002) argue that the protection of shareholders' rights is stricter in masculine societies. As a result, firms are more transparent and it is hard for them to misreport information, thereby improving information content of stock prices (Gray et al., 2012). We, therefore, expect higher sensitivity of investment to stock prices in individualistic cultures with high masculinity than individualistic cultures with low masculinity. Furthermore, uncertainty avoidance is also related with the demand for information. In these cultures, individuals tend to avoid uncertainty, thereby making them collect and analyze as much information as possible. Amirhosseini (2012) argues that individuals in cultures with high uncertainty avoidance tend to minimize the occurrence of unknown and unusual circumstances by carefully planning and implementing rules, laws and regulations. Consequently, information content in stock prices is higher in cultures with high uncertainty avoidance (**REFERENCE**). We, therefore, expect higher sensitivity of investment to stock prices in individualistic cultures with high uncertainty avoidance than individualistic cultures with low uncertainty avoidance.

Sub hypothesis 2a: Sensitivity of investment to stock prices is lower in individualistic cultures with higher power distance than in individualistic cultures with lower power distance.

Sub hypothesis 2b: Sensitivity of investment to stock prices is higher in individualistic cultures with higher masculinity than in individualistic cultures with lower masculinity.

Sub hypothesis 2c: Sensitivity of investment to stock prices is higher in individualistic cultures with higher uncertainty avoidance than in individualistic cultures with lower uncertainty avoidance.

In order to document the effect of country-specific cultural environment on the relationship between individualism and sensitivity of investment to stock prices, we introduce the following interaction terms in Equation (1): $Q*IND*PDISTANCE$, $Q*IND*UAVOIDANCE$, and $Q*IND*MASCULINITY$. The results of our analysis are reported in Table 6. Our results in this table confirm our arguments of significant impact of cultural characteristics on the sensitivity of investment to stock prices. We report significantly negative coefficient of $Q*IND*PDISTANCE$ and significantly positive coefficient of $Q*IND*UAVOIDANCE$, and $Q*IND*MASCULINITY$. It indicates that sensitivity of investment to stock prices is significantly affected by the cultural characteristics of the country.

[Insert Table 6 here]

6.3 Effect of social environment on the relationship between individualism and sensitivity of investment to stock prices

This paper defines social environment of a country by ethnic fractionalization (ETHNIC), linguistic fractionalization (LINGUISTIC), and religious fractionalization (RELIGIOUS). These variables indicate the probability that two randomly selected individuals from a country are from different ethnic, linguistic, or religious groups. We argue that the social environment of a country can be instrumental in determining the effect of individualism on sensitivity of investment to stock prices. Alesina et al. (2003) and Alesina

and Spolaore (2003) argue that heterogeneity in society (fractionalization) is an important determinant of political stability, quality of institutions, and economic policies. Prior literature documents that, in highly diverse societies, the group that comes to power tends to implement policies that expropriate as many resources as possible from the ethnic losers, restrict the rights of other groups, and prohibit the growth of industries or sectors that threaten the ruling group (Annet, 2001; Alesina et al., 1999; Easterly and Levine, 1997). When these results are applied to the financial sector, the implications are clear: greater ethnic diversity implies the adoption of policies and institutions that are focused on maintaining power and control, rather than on creating an open and competitive financial system (Beck et al., 2003). Given the adverse impact of social heterogeneity on economic and institutional indicators, we expect less informative stock prices in countries with heterogeneous societies. As a result, we expect lower sensitivity of investment to stock prices in individualistic cultures with high social heterogeneity than individualistic cultures with low social heterogeneity.

Sub hypothesis 3a: Sensitivity of investment to stock prices is lower in individualistic cultures with higher ethnic fractionalization than in individualistic cultures with lower ethnic fractionalization.

Sub hypothesis 3b: Sensitivity of investment to stock prices is lower in individualistic cultures with higher linguistic fractionalization than in individualistic cultures with lower linguistic fractionalization.

Sub hypothesis 3c: Sensitivity of investment to stock prices is lower in individualistic cultures with higher religious fractionalization than in individualistic cultures with lower religious fractionalization.

In order to document the effect of country-specific social environment on the relationship between individualism and sensitivity of investment to stock prices, we introduce the following interaction terms in Equation (1): $Q*IND*ETHNIC$, $Q*IND*LINGUISTIC$, and $Q*IND*RELIGIOUS$. The results of our analysis are reported in Table

7. Our results confirm our arguments of significant impact of social characteristics on the relationship between individualism and sensitivity of investment to stock prices. We report significantly negative coefficient of $Q*IND*ETHNIC$ and $Q*IND*LINGUISTIC$. It indicates that the effect of individualism reduces sensitivity of investment to stock prices more in countries with heterogeneous societies than in countries with homogeneous societies.

[Insert Table 7 here]

7. Conclusion

In this paper, we test the hypothesis that individualism affects the ability of managers to use information from the stock market to make value enhancing investment decisions. Our results show that the investment of firms headquartered in individualistic cultures is significantly less sensitive to their stock prices than that of firms headquartered in collectivist cultures. This finding is significant and robust to a host of estimation procedures. We also show that the effect of individualism on sensitivity of investment to stock prices is moderated by the institutional, cultural, and social environment of a country. Individualistic countries with stronger institutions have higher sensitivity of investment to stock prices than individualistic countries with weaker institutions. Our results also show that the effect of individualism on sensitivity of investment to stock prices is higher in countries with high power distance and lower in countries with high uncertainty avoidance and high masculinity. Furthermore, we also show that firms headquartered in heterogeneous societies have more negative impact of individualism on sensitivity of investment to stock prices than firms headquartered in homogeneous societies.

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Appendix 1: Definition of variables

NOTATION	Definition	Source
Q	It is computed as market value of equity plus book value of assets minus the book value of equity, scaled by book assets.	Worldscope
IND	It is the measure of individualism in a country. It ranges from 0 to 100, where 0 refers to full collectivism and 100 to full individualism.	Hofstede's Cultural Indicators
SIZE	Log of total assets	Worldscope
LEVERAGE	Total debt to total asset ratio	Worldscope
GROWTH	One year growth in total assets	Worldscope
EPS	Earnings per share	Worldscope
ANALYST	Total number of analysts issuing forecasts for a firm during a year	I/B/E/S
IFRS	It is a dummy variable that takes the value of 1 if the firm used IFRS as an accounting standard and 0 otherwise.	Worldscope
RLAW	It measures the extent to which agents abide by the rules. It includes perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. It measures the success of a society in developing an environment in which fair and predictable rules form the basis for economic and social interactions.	World Bank's Governance Indicators
FINVEST	It is a measure of overall investment climate and scrutinizes country's policies toward foreign investment, as well as its policies toward capital flows. It ranges between 0 and 100.	Heritage Foundation
FTRADE	It measures the presence of trade barriers in a country. It ranges between 0 and 100.	Heritage Foundation
PDISTANCE	It refers to the extent to which the society accepts unequal distribution of power within itself. It ranges from 0 to 100.	Hofstede's Cultural Indicators
UAVOIDANCE	It measures the extent to which people feel uncomfortable with uncertain circumstances. It ranges from 0 to 100, where 0 refers to full uncertainty seeking and 100 to full uncertainty avoidance.	Hofstede's Cultural Indicators
MASCULINITY	It is the measure of masculinity in a country. It ranges from 0 to 100, where 0 refers to full femininity and 100 to full masculinity.	Hofstede's Cultural Indicators
ETHINC	It reflects the probability that two randomly selected people from a given country will not share same ethnicity. The higher the number, the less probability of the two sharing same ethnicity.	Alesina et. al (2003)
LINGUISTIC	It reflects the probability that two randomly selected people from a given country will not share same language. The higher the number, the less probability of the two sharing same language.	Alesina et. al (2003)
RELIGIOUS	It reflects the probability that two randomly selected people from a given country will not share same religion. The higher the number, the less probability of the two sharing same religion.	Alesina et. al (2003)

Table 1: Descriptive statistics for individualism

Country	Region	Individualism	Country	Region	Individualism
Argentina	Latin America	46	Bangladesh	Asia	20
Brazil	Latin America	38	China	Asia	20
Chile	Latin America	23	India	Asia	48
Colombia	Latin America	13	Indonesia	Asia	14
Mexico	Latin America	30	Malaysia	Asia	26
Peru	Latin America	16	Pakistan	Asia	14
Venezuela	Latin America	12	Philippines	Asia	32
Bulgaria	Europe	30	South Korea	Asia	18
Czech Republic	Europe	72	Sri Lanka	Asia	35
Greece	Europe	35	Taiwan	Asia	17
Hungary	Europe	80	Thailand	Asia	20
Poland	Europe	60	Vietnam	Asia	20
Romania	Europe	30	Israel	Asia	54
Russia	Europe	39	Jordan	Asia	30
Turkey	Europe	37	Kuwait	Asia	25
Egypt	Africa	25	Saudi Arabia	Asia	25
Morocco	Africa	46	United Arab Emirates	Asia	25
Ghana	Africa	15			
Nigeria	Africa	30			
South Africa	Africa	65			

Table 2: Individualism and sensitivity of investment to stock prices

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Q	0.9385***	1.3431***	1.2766***	1.4425***	0.8216***
IND	0.0426***	0.0234***	0.0214***	0.0137***	0.0332***
Q*IND	-0.0130***	-0.0134***	-0.0126***	-0.0156***	-0.0116***
SIZE	0.3275***				0.4570***
LEVERAGE	0.0160***				0.0111***
GROWTH	0.0067***				0.0061***
EPS	0.1912***				0.0994***
ANALYST	0.0369***				0.0163**
IFRS	-1.2068***				-0.2917**
RLAW		-0.3592**			0.5347
FINVEST		-0.0105**			0.0302***
FTRADE		-0.1016***			-0.1151***
PDISTANCE			-0.0001		0.0117***
UAVOIDANCE			-0.0200***		-0.0086**
MASCULINITY			-0.0017		-0.0168***
ETHINC				-3.3281***	-1.8080***
LINGUISTIC				2.5172***	1.9264***
RELIGIOUS				0.0373	-0.5838**
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	40904	45599	45599	45599	40904
F-Value	90.78***	77.17***	65.97***	65.56***	78.06***
Adjusted R-Square	0.0466	0.0379	0.0325	0.0333	0.0563

Table 3: Individualism and sensitivity of investment to stock prices (quantile regression approach)

Variables	Quantile = 0.10	Quantile = 0.30	Quantile = 0.50	Quantile = 0.70	Quantile = 0.90
Q	-0.0008	0.2636***	0.5420***	1.2355***	2.5960***
IND	0.0034***	0.0222***	0.0342***	0.0551***	0.0490**
Q*IND	-0.0010*	-0.0079***	-0.0127***	-0.0256***	-0.0270**
SIZE	0.1404***	0.3808***	0.5536***	0.6928***	0.5332***
LEVERAGE	0.0006***	0.0012	0.0037**	0.0107***	0.0342***
GROWTH	0.0004***	0.0018***	0.0039***	0.0069***	0.0136***
EPS	0.0170	0.0901***	0.1212***	0.2082***	0.2086***
ANALYST	0.0366***	0.0415***	0.0395***	0.0188	0.0011
IFRS	0.0542***	0.0401	-0.0474	-0.3663**	-0.3754
RLAW	0.0537	-0.3441*	-0.3479	0.0787	2.5911**
FINVEST	-0.0019	0.0022	0.0119***	0.0399***	0.1119***
FTRADE	-0.0066***	-0.0147***	-0.0436***	-0.1217***	-0.3165***
PDISTANCE	-0.0013*	0.0016	0.0093***	0.0271***	0.0660***
UAVOIDANCE	-0.0008	-0.0053***	-0.0035	-0.0001	-0.0046
MASCULINITY	-0.0016**	-0.0115***	-0.0210***	-0.0260***	-0.0126
ETHINC	-0.1343*	-0.7450***	-1.6083***	-2.6211***	-4.6320***
LINGUISTIC	-0.0091	0.2025	1.1750***	2.6009***	6.4568***
RELIGIOUS	0.0003	0.1368	0.1488	0.1516	-1.8470***
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	40904	40904	40904	40904	40904
Pseudo R-Square	0.0266	0.0508	0.0580	0.0581	0.0531

Table 4: Individualism and sensitivity of investment to stock prices in different sub-samples

Variables	Small Firms	Large Firms
Q	1.1378***	0.9593***
IND	0.0296***	0.0360***
Q*IND	-0.0128	-0.0143**
SIZE	0.5589***	0.1735***
LEVERAGE	0.0016	0.0250***
GROWTH	0.0061***	0.0066***
EPS	0.4735***	-0.0190
ANALYST	0.7402***	0.0531***
IFRS	-0.4209**	0.0525
RLAW	1.2075*	-0.7810*
FINVEST	0.0243**	0.0257**
FTRADE	-0.1471***	-0.0524***
PDISTANCE	0.0019	0.0116**
UAVOIDANCE	-0.0128*	-0.0118*
MASCULINITY	0.0144*	-0.0387***
ETHINC	-0.6521	-3.3039***
LINGUISTIC	0.7259	2.0251***
RELIGIOUS	-0.6664	0.2202
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
No. of Observations	21019	19885
F-Value	30.37***	34.01***
Adjusted R-Square	0.0453	0.0534

Table 5: Effect of country-specific institutional environment on the relationship between individualism and sensitivity of investment to stock prices

Variables	Model (6)	Model (7)	Model (8)
Q	1.0095***	1.0631***	0.9038***
IND	0.0379***	0.0381***	0.0339***
Q*IND	-0.0188***	-0.0398***	-0.1215***
SIZE	0.4713***	0.4651***	0.4775***
LEVERAGE	0.0109***	0.0108***	0.0111***
GROWTH	0.0061***	0.0061***	0.0062***
EPS	0.0952***	0.0871***	0.0802**
ANALYST	0.0152*	0.0192**	0.0214***
IFRS	-0.2838**	-0.2954**	-0.3421***
RLAW	-0.3191	0.5589	0.4685
FINVEST	0.0336***	0.0093	0.0279***
FTRADE	-0.1279***	-0.1330***	-0.1817***
Q*IND*RLAW	0.0198***		
Q*IND*FINVEST		0.0004***	
Q*IND*FTRADE			0.0014***
PDISTANCE	0.0183***	0.0164***	0.0168***
UAVOIDANCE	-0.0076*	-0.0051	-0.0084**
MASCULINITY	-0.0176***	-0.0162***	-0.0197***
ETHINC	-2.0109***	-1.9160***	-1.7420***
LINGUISTIC	2.1239***	2.2580***	2.3685***
RELIGIOUS	-0.2520	-0.4760*	-0.5639**
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. of Observations	40904	40904	40904
F-Value	78.86***	77.88***	81.54***
Adjusted R-Square	0.0575	0.0577	0.0586

Table 6: Effect of country-specific cultural environment on the relationship between individualism and sensitivity of investment to stock prices

Variables	Model (9)	Model (10)	Model (11)
Q	0.9868***	0.9904***	0.8456***
IND	0.0366***	0.0288***	0.0352***
Q*IND	0.0059	-0.0431***	-0.0303***
SIZE	0.4573***	0.4631***	0.4651***
LEVERAGE	0.0111***	0.0105***	0.0113***
GROWTH	0.0061***	0.0061***	0.0062***
EPS	0.0969***	0.0851***	0.0957***
ANALYST	0.0198**	0.0210***	0.0153*
IFRS	-0.3151**	-0.2030	-0.2814**
RLAW	0.5195	0.6846**	0.4299
FINVEST	0.0261***	0.0321***	0.0288***
FTRADE	-0.1247***	-0.1408***	-0.1122***
PDISTANCE	0.0281***	0.0132***	0.0117***
UAVOIDANCE	-0.0056	-0.0243***	-0.0095**
MASCULINITY	-0.0160***	-0.0120**	-0.0322***
Q*IND*PDISTANCE	-0.0003***		
Q*IND*UAVOIDANCE		0.0005***	
Q*IND*MASCULINITY			0.0003*
ETHINC	-1.9801***	-1.8879***	-1.9033***
LINGUISTIC	2.1701***	2.4837***	1.8750***
RELIGIOUS	-0.7936***	-0.4765*	-0.6225**
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. of Observations	40904	40904	40904
F-Value	76.10***	79.41***	77.00***
Adjusted R-Square	0.0570	0.0582	0.0565

Table 7: Effect of country-specific social environment on the relationship between individualism and sensitivity of investment to stock prices

Variables	Model (12)	Model (13)	Model (14)
Q	0.7470***	0.5361***	0.8554***
IND	0.0320***	0.0207***	0.0347***
Q*IND	-0.0040	0.0085	-0.0096**
SIZE	0.4660***	0.4719***	0.4580***
LEVERAGE	0.0111***	0.0108***	0.0111***
GROWTH	0.0061***	0.0062***	0.0061***
EPS	0.0983***	0.0904***	0.0985***
ANALYST	0.0161*	0.0186**	0.0161*
IFRS	-0.2750**	-0.2172*	-0.2722**
RLAW	0.5351	0.7261**	0.5081
FINVEST	0.0329***	0.0391***	0.0293***
FTRADE	-0.1208***	-0.1318***	-0.1155***
PDISTANCE	0.0113***	0.0125***	0.0107***
UAVOIDANCE	-0.0093**	-0.0100**	-0.0084**
MASCULINITY	-0.0177***	-0.0168***	-0.0166***
ETHINC	-1.1777**	-1.8881***	-1.7071***
LINGUISTIC	1.9323***	3.1709***	1.9003***
RELIGIOUS	-0.4029	-0.4598*	-0.2452
Q*IND*ETHINC	-0.0148*		
Q*IND*LINGUISTIC		-0.0234***	
Q*IND*RELIGIOUS			-0.0069
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. of Observations	40904	40904	40904
F-Value	75.92***	78.30***	75.68***
Adjusted R-Square	0.0564	0.0570	0.0563