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DETERMINANTS OF STOCK MARKET LIQUIDITY. THE QUANTIFIABLE EFFECTS OF PSYCHIC DISTANCE STIMULI

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Abstract. Our study aims to narrow the existing gap in the academic literature on cultural determinants of stock market liquidity by addressing the problem through a completely new lens - that of the international investor's point of view. To do this, we resort to bringing together the financial and psychological concepts and use a proxy that can measure the perception an individual investor has upon the differences between his/her home country and other countries.The motivation behind this decision is as follows: despite there being a vast majority of studies analyzing the cross-country cultural distance effects upon the stock market liquidity, they only resume to describing those effects through the perspective of the domestic investor. We decided to go one step further and employ a proxy to capture the effects of the difference between the home country and the target country upon an investor's decisions to trade internationally, which in turn, can affect the overall liquidity of the stock market in the target country. This proxy is called "psychic distance stimuli" and was first measured and used by Douglas Dow. We performed the analysis on a rather extensive sample of 21 developed and 24 developing countries, spanning an interval of 22 years, beginning in 1996. The results confirm our hypothesis that the measure of psychic distance plays a significant role in explaining the liquidity of the stock market in the target country.

1. Introduction

The last financial crisis has shown us once again, the importance of stock markets and the role they play in the global economy. Unfortunately, it did so by highlighting the biggest weaknesses of the stock markets. One such weakness being stock market liquidity. Academic literature defines it as the possibility of an investor to exit the market in the shortest amount of time with the least possible loss at any given moment. A characteristic that has been an important precondition for all existent stock markets. Furthermore, the importance of this characteristic has risen dramatically since globalization intensified. Now, more and more investors turn their gaze toward markets with higher liquidity.

Stock market liquidity and its determinant are, by far, the most important topics of the last decade. Investors, politicians, and academia alike have asked themselves: Why is liquidity drying up?

There is a large pool of academic literature examining the macro-level determinants and the 'dry up' mechanics of the stock market liquidity through either the 'supply-side factors' or the 'demand side factors' perspective. Existing literature documents that macroeconomic variables, stock-exchange trading rules, investor-protection rules, information environment, market microstructure issues, and firm-specific characteristics are possible sources of variation in liquidity (Debata, Dash and Mahakud 2017, 124)

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Nonetheless, a new trend in analyzing this subject through the individual investor's perspective has emerged. This study implies diverging away from some classical financial concepts into a more transdisciplinary network and borrowing some instruments from areas such as psychology, sociology, management, and international business studies. The research question becomes: "How does the investor's sentiment (Debata, Dash and Mahakud 2017), religion (Blau 2018), culture (Tan, Cheong and Zurbruegg 2019), or genotype influence the stock market liquidity?"

For the past several years, studies that analyze the cultural impact on the decision-making process have gained an extraordinary resonance, be it at the **individual level** (Grinblatt and Keloharju 2001, Guiso, Sapienza and Zingales 2008, Chui, Titman and Wei 2010, Siegel, Licht and Schwartz 2011, Eun, Wang and Xiao 2015), **company level** (Giannetti and Yafeh 2012, Shao, Kwok and Guedhami 2010, Li, et al. 2013, Ahern, Daminelli and Fracassi 2015), or **country level** (Stulz and Williamson 2003, Kwok and Tadesse 2006, Aggarwal and Goodell 2014, Gorodichenko and Roland 2011).

In one of their more recent studies Aggarwal and Goodell (2014) argue that culture can influence financial decision-making through beliefs or values that influence individual agents' perceptions, preferences, and behaviors. As a result, culture ultimately affects utilities of financial choices both at the individual level and, if frictions are present, at the firm and national levels.

One way culture has been incorporated in financial models is through a proxy that quantified the difference between two nations, those differences being incorporated in the "cultural distance" variable. The usual proxy for "cultural distance" is a composite index of the N cultural dimensions characteristic of the country analyzed.

The Psychic distance concept is a fairly similar concept to cultural distance, although quite more complex. According to Johanson & Wiedersheim-Paul, (1975), unlike cultural distance, psychic distance refers to "factors preventing or disturbing the flows of information between firm and market". The same authors list "differences in language, culture, political systems, level of education, level of industrial development, etc." (Johanson and Wiedersheim-Paul 1975) as a few examples of such factors. According to Blomkvist and Drogendijk (2013), these factors are assumed to increase uncertainty and the likelihood of misinterpreting information, influencing, directly or indirectly, investor's decision to enter a certain stock market.

Although such a decision would be firstly determined by the existence/appearance of a profit-bearing opportunity, there are many instances of investors leaving such opportunities due to factors that feed their aversion to risk.

In this article, we want to isolate some of those factors using psychic distance. We've structured the article into three parts. Section 1 of the article goes into detail with some literature review on the topic of stock market liquidity, as well as presents some hypotheses of how psychic distance can influence it. Section 2 is a concise presentation of our model specification, going into detail about variable selection and estimation; whereas in the third and last section we will present the regression results, findings, and some conclusions regarding this study. We will also state some further research directions there.

2. Literature review

Psychic distance is a rather new concept for Empirical Finance, nonetheless, it is one of the most cited constructs in the field of International Business Studies, being extensively used by academics in their studies to explain: "the decision to export", "market selection decisions", "entry mode choices", "international performance", "the degree of adaptation in foreign markets" and others.

Moreover, Cho and Padmanabhan (2005) highlight that "Since Hofstede (1980) developed his famous dimensions to measure cultural distance, researchers (...) have used it extensively in attempting to explain differences in performance, strategies, etc. across countries, almost to the point that no international business study can be considered complete unless there is an

explicit variable controlling for cultural distance.". As far as we know though, this concept has barely ever been used in finance.

The first-ever mention of psychic distance can be found in the concluding remarks of a 1956 Beckerman study about international trade movements.

The nowadays representation of it, however, was built by researchers from Uppsala University, as part of a study of companies' internationalization process (Johanson and Wiedersheim-Paul 1975, Johanson and Vahlne 1977). They developed this measure in a pursuit to explain the export and investment behavior of Swedish firms with the help of a concept that captured the perceived distance to foreign markets in the eyes of managers (Blomkvist and Drogendijk 2013).

The authors have defined psychic distance as a set of "factors preventing or disturbing the flow of information between firm and market" (Johanson and Wiedersheim-Paul 1975). According to them, some of those factors are language differences, culture, political system, educational level, and the level of economic development of the analyzed country. The argument behind their conclusions was that any of those factors can build up upon investors' uncertainty regarding the foreign market of interest. Furthermore, it could result in a wrong interpretation of available information, impeding the company's international reach. The bigger the psychic distance to a country, the lesser the probability of the company investing in this country.

To measure the various types of psychic distance stimuli, Dow & Karunaratna (2006) have adopted six scales:

- Differences in language and religion between countries were measured using three items. The first item is a five-point scale indicating the 'distance' between the major languages and religions of each country using a hierarchy of languages and religions (Dow and Karunaratna 2006). The second and third items are five-point scales indicating the proportion of the population who speak (or are adherents of) one of the other country's major languages (or religions). E.g. the proportion of Americans who speak Japanese and the proportion of Japanese people who speak English.
- Differences in levels of education and degree of industrialization were measured using three and nine-item scales respectively. For these two instruments, Dow & Karunaratna (2006) used data from the United Nations (UN, 1995, UN, 1995).
- To quantify differences in the degree of democracy, a four-item instrument was employed, combining scales from Henisz (2000), Gleditsch (2003), and Freedom House (2000).

To incorporate the remaining aspects of differences in political systems, Beck et al's (2001) scale of political ideology is employed. It measures the extent to which the government in power is biased toward socialist policies. Whereas to quantify the cultural differences, most other studies use one of the subsequent four datasets: Hofstede (2001), Schwartz (2006), GLOBE (2016) & World Values Survey (2014). We use Hofstede's measures as a proxy for cultural distance.

A significant difference between our paper and the studies presented above is that we did not include cultural distance in the composite index for psychic distance, we did so to highlight the individual effects of psychic and cultural distances on stock market liquidity.

The globalization of capital markets provides a bridge between financial markets of industrialized countries and emerging economies, encouraging international trading of assets such as bonds, shares, and currencies between governments, banks, companies, and markets (Lee and Chou 2018). A study by Levine and Zervos (1996) shows that financial liberalization leads to an increase in stock market liquidity; additionally, Levine (2005) suggests that despite the existence of significant differences in financial market development across countries, due to capital market globalization emerging economies can obtain funds at substantially lower costs in the global capital market. As such, emerging economies can accumulate capital, and increase the size and liquidity of their local financial markets, unless, of course, those capital movements are prevented or disturbed by the set of factors we call psychic distance.

Although at first, it was a specific measure that only quantified an individual's perception regarding the distance between two countries, with time it was adapted to be used in country-level studies. It is increasingly used to explain company behavior regarding entry-mode choice (Dow and Larimo 2009), trade flow (Stöttinger and Schlegelmilch 1998, Dow and Karunaratna 2006), market selection (Dow 2000, Brewer 2007), or FDI (Barkema, Bell and Pennings 1996).

Bouncing back to the main focus of this study, we shall ask ourselves: What are the factors and tools through which psychic distance could influence stock market liquidity?

- The differences in culture, language, and educational backgrounds of two focus groups (economies) will result in higher costs of informational exchange between the two, increasing the probability of miss-interpretation (Boyacigiller 1990); a characteristic that will, on the one hand, affect the know-how transfer between them (impeding the development of stock markets), and, on the other hand, corrupt the flow of financial information from the market towards the investor (diminishing the volume of international investments);
- Moreover, some cultural differences we have mentioned before may decrease the trust level between investors belonging to different markets. Guiso et al. (2008) speak of an investor's trust, showing that an investor's conviction that he might get conned has a direct influence over his willingness to enter a market or buy a security.

Although with some empirical evidence behind them, the theories listed before are to us some hypotheses we are willing to test in the third part of this paper.

3. Data description and variables definitions

This section of the paper presents information about databases used, sample building, and variables construction.

3.1. **Data sources and screens.** We began by obtaining daily closing prices and dollar trading volumes for 20,850 stocks from 45 countries for a period of 22 years (1996-2017), using the Thomson Reuters Datastream platform. Our final sample totaling to 990 country-year pairs.

Out of the original 45 countries (Karolyi, Lee and van Dijk 2012), 21 are developed (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Italy, Japan, the Netherlands, New Zeeland, Norway, Singapore, Spain, Sweden, Switzerland, the UK, and the USA), and 24 are emerging economies (Argentina, Brazil, Chile, China, Columbia, Hungary, India, Indonesia, Israel, South Korea, Malaysia, Mexico, Pakistan, Peru, Philippine, Poland, Portugal, Russia, South Africa, Sri Lanka, Taiwan, Thailand, Turkey, and Venezuela).

Our preference for countries and the time frame is given by data availability and comparability. The following screens were used to clean the originally downloaded data:

(1) We use only ordinary stocks, traded in the local currency and listed on the main exchange in each country.

(2) We include both active and dead stocks.

(3) Days on which 90% or more of the stocks in a given exchange have zero returns are excluded.

(4) Following Ince and Porter (2006), to clean the data for outliers, we deleted daily rentabilities exceeding 200%, and the rentabilities that satisfy the following condition – $(1+r_{i,d})*(1+r_{i,d-1})-1 \leq 50\%$, where $r_{i,d}$ is the rentability of stock I on day d, $r_{i,d}$ and/or $r_{i,d-1}$ bigger than 100% were also screened out of our sample.

3.2. **Stock market liquidity.** Although the concept of stock market liquidity is as old as empirical finance, it has always been elusive to measure or account for. There is a large pool of proposed proxies to choose from, that are used widely by researchers, analysts, investors, and other parties alike. Nevertheless, each of those measures comes with a list of advantages and disadvantages, building upon the reason there is no universally accepted measure of liquidity. In a study from 2005, Lesmond tests five liquidity measures for efficiency on a sample of 31

emerging countries. He argues that LOT from Lesmond et al. (1999) and a measure by Roll (1984) are best for depicting liquidity variation between countries, whereas LOT and Amihud's ILLIQ (2002) are best for country-specific studies. Marshall et al. (2013) studied which liquidity proxy is best for developing countries by calculating correlations and mean squared errors between the liquidity benchmark and its proxies. The Gibbs estimated measure (Hasbrouck 2004, 2009) and Amihud (2002) have the highest correlation coefficients with the benchmark. The FHT proxy, by Fong et al. (2017) has the least average of squared residuals, which makes it the best estimator for transaction costs.

Keeping in mind the difficulty of calculating liquidity measures on intraday data Fong et al. (2017) have examined which low-frequency liquidity proxy is the best for global-level studies. The authors used three performance parameters (average cross-section correlation, time correlation, and average squared errors) and simulated a race of monthly and daily liquidity proxies against five benchmarks (effective percentage spread, quoted percentage spread, realized percentage spread, lambda coefficient, and the percentage price impact). Their results show that the percentage spread from Chung & Zhang (2014) is the best cost-percentage spread of liquidity for both daily and monthly estimations for global studies, although the maximum-minimum measure from Corwin & Schultz (2014) proved to be the best at quantifying realized percentage spread.

Amihud's measure is the best proxy for analyzing price impact. In the case of studies on emerging markets, LOT and Roll measures are better than Amihud's ILLIQ and turnover in measuring inter-country variations.

In more recent studies, Chung & Zhang (2014), have considered Amihud's measure as the best percentage-cost proxy of liquidity for global studies, at a daily level and monthly level alike. To sum up, analyzing the existing liquidity measures and taking into consideration the advantages and disadvantages of each of them, we chose to work with Amihud's ILLIQ measure as being best suited for our study.

In 2002, Amihud developed an illiquidity measure which can be defined as a ratio between the absolute value of daily stock rentability and the dollar trading volume for the day t. For given security i in the month m Amihud's ILLIQ measure can be calculated as follows:

$$Illiq_{i,m} = \frac{1}{N_{i,m}} \sum_{t-1}^{N_{i,m}} \frac{|R_{i,t,m}|}{Vol_{i,t,m}} \tag{1}$$

where $N_{i,m}$ is the number of days with a positive trading volume of the stock i in the month m, $|R_{i,t,m}|$ is the absolute value of daily rentabilities of the stock i in month m, and $Vol_{i,t,m}$ is the dollar-denominated volume for the stock i on the day t of the month m.

This measure is widely used in academic literature, being deemed as one of the most efficient low-frequency measures of liquidity (Acharya and Pedersen 2005, Karolyi, Lee and van Dijk 2012).

3.3. **Psychic distance.** Just like liquidity, psychic distance is a widely used concept in International Business studies. Despite that, until now, there is no generally accepted proxy for its measurement. Various authors bring critique to its measurement technique (Shenkar 2001), factors included (Zhao, Luo and Suh 2004)or even the name „psychic distance" as opposed to „psychic distance stimuli" (Harzing 2002).

We decided to opt for the methodology described by Dow and Karunaratna (2006) as it is the most recent one and stands against most critiques (Appendix 1). The individual scores for each of the five variables are publicly available (2008) and are subsequently converted into a single composite index using Kogut and Singh's (1988) methodology:

$$PD_{i,j} = \sum_{k=1}^{5} \left(\frac{(I_{i,j,k})^2 / V_k}{5} \right) \tag{2}$$

I_{ijk} is the distance between countries i and j for the k-th dimension of psychic distance, and V_k is the variance of the k-th dimension of the psychic distance across 120 countries.

3.4. **Cultural distance.** Cultural distance measures the cultural differences between two countries or regions. As culture cannot be changed in shorter periods of time, we assume that cultural characteristics and cultural distance are constant for the time frame of this study. The comprehensive cultural distance index (KSI) is used to measure cultural distance. According to the method proposed by Kogut and Singh (1988), the KSI is based on the four cultural dimensions identified by Hofstede, and is measured using the following formula :

$$CD_{i.j} = KS_{i,j} = \sum_{d=1}^{4} \left(\frac{(I_{i,d} - I_{j,d})^2 / V_d}{4} \right) \tag{3}$$

where $KS_{i,j}$ denotes the cultural distance between country/region i and country/region j, $I_{i,d}$ and $I_{j,d}$ indicate the values of country/region i and j on cultural dimension d, and V_d denotes the variance of the samples on dimension d.

Country-specific cultural dimension scores can be downloaded from Geert Hofstede's website (www.geert-hofstede.com). We include the following 4 dimensions in our study: Uncertainty avoidance, Individualism, Masculinity, and Power Distance. According to Hofstede (2018): "uncertainty avoidance (UA) is the extent to which the members of a culture feel threatened by ambiguous or unknown situations", "Individualism (IDV) is the extent to which people feel independent, as opposed to being interdependent as members of larger wholes". "Masculinity (MAS) is the extent to which the use of force is endorsed socially", whereas "Power Distance (PwD) expresses the degree to which the less powerful members of a society accept top-down decisions and expect that power is distributed unequally".

This study measures both, the cultural and the psychic distance of each country in comparison to the USA. We use the USA as a benchmark because, firstly it has the biggest and the most developed stock market, and secondly, it is the country with the most internationally-exposed investors.

3.5. **Control variables.** We followed Karolyi and van Dijk, (2012) to control for the country-level specific characteristics, including in our model the following variables: company Herfindal index and Industry Herfindal index to account for market concentration, GDP growth volatility as a measure of macroeconomic stability, number of stocks and market value to GDP ratio to quantify for the stock market size, and country's geographical size, and GDP per Capita as proxies for the country's economic potential.

GDP per capita, GDP growth, bank deposits to GDP ratio, number of internet users, and the Worldwide Governance Indicator of "Rule of Law" were obtained using the database provided by the World Bank for the period from 1996 until 2017, and were also included as control variables.

The Rule of Law was defined as "reflected perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Glossary 2020).

The Freedom of press index was obtained from the Freedom House website and "assesses the degree of print, broadcast, and digital media freedom in 199 countries and territories" (Freedom in the World 2000).

4. Empirical Results

Our analysis was conducted in two steps, on the one hand using the psychic distance as an exogenous variable, and on the other hand – cultural distance and its components.

At first, we investigate the effects of psychic distance on stock market liquidity.

As it can be seen, regression results are consistent with our hypothesis and build upon our expectations of psychic distance playing an important role in explaining stock market illiquidity. The coefficients remain robust after the inclusion of additional control variables such as financial disclosure, rule of law, freedom of the press, the ratio of people with internet access, and the ratio of bank deposits to the country's GDP. We follow this by testing our second specification, adding cultural distance to the model. Contrary to our expectations, the beta coefficient for cultural distance is insignificant, and we can see a sign-reversal in opposition to psychic distance; a result which is inconclusive with the findings of Zhou & Guillèn (2015), and Eun et al. (2015).

Table 2. Regression results of psychic distance on market illiquidity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PD	0.0097***	0.0100***	0.0126***	0.0091***	0.0090**	0.0125***	0.0093**
	(2.65)	(2.68)	(3.28)	(3.01)	(2.42)	(3.05)	(2.45)
CD		-0.0023					
		(-0.55)					
dep/GDP			0.00002				
			(0.43)				
Fin_discl				0.0742*			
				(1.92)			
Rul_law					-0.0037		
					(-1.04)		
Fr_pres						-0.0004	
						(-1.44)	
Int_usr%							-0.00007
							(0.41)
Ihhi	0.0061	0.0063	0.0349	0.0147	0.0080	0.0022	0.0013
	(0.24)	(0.25)	(1.49)	(0.67)	(0.33)	(0.008)	(0.04)
Fhhi	-0.0051	-0.0067	-0.0224	-0.0163	-0.0065	0.0026	0.00006
	(-0.33)	(-0.46)	(-1.59)	(-1.36)	(-0.46)	(0.16)	(0.00)
ln(#cmp)	0.0037	0.0037	0.0067	-0.0028	0.0036	0.0049	0.0041
	(0.91)	(0.92)	(1.49)	(-0.68)	(0.86)	(1.22)	(0.95)
GDP vol	-0.0075**	-0.0071*	-0.0102**	-0.0089**	-0.0087**	-0.0057	-0.0072**
	(-2.02)	(-1.93)	(-2.38)	(-2.44)	(-2.22)	(-1.41)	(-1.97)
CB/GDP	-0.00007*	-0.00007*	-0.00007*	-0.00007*	-0.00006*	0.00008*	-0.00006*
	(-1.84)	(-1.83)	(-1.86)	(-1.80)	(-1.78)	(-1.78)	(-1.84)
ln(g_size)	-0.0054***	-0.0057***	-0.0047**	-0.0032*	-0.0053***	-0.0062***	-0.0061***
	(-3.29)	(-3.26)	(-2.57)	(-1.83)	(-3.18)	(-3.15)	(-2.82)
Overall R^2	0.2982	0.3031	0.4463	0.3706	0.2980	0.3462	0.3155

Note: As some variables in our model are time-invariant, we use a random-effects model. Figures in parenthesis are t- statistics. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Despite the betas for control variables being insignificant, their sign is in line with our expectations. Speaking of the bank deposits to GDP ratio, we see a positive dependency between it and our dependent variable; as such the higher the ratio the lower is the country's stock market liquidity. Rule of law and freedom of the press have a negative impact on illiquidity, which is in line with our hypothesis that the more powerful are the press and the law of a country, the more liquid would its stock market be. Additionally, the variables meant to control for

a country's development level have a positive impact on the trading intensity and as such, on stock market liquidity. Contrary to our expectations, the beta coefficient for financial disclosure has a positive sign, implying that better disclosure would lead to lower market liquidity. This anomaly could be potentially explained by the heterogeneity of our pool sample, as financial disclosure does indeed have different effects on developed and emerging countries. Things are not so simple concerning GDP growth volatility. Although we are expecting that higher levels of macroeconomic stability would lead to higher market liquidity, it could potentially be the macroeconomic instability that pushes trading volumes and makes investors constantly adjust their investment portfolios, driving liquidity up.

The second step of this analysis is meant to shed some light on the unexpected coefficient sign for the cultural distance we obtained while regressing the first model.

So, to focus on cultural distance, we decided to isolate psychic distance away from our regression. New regression results are presented in Table 3. Cultural distance plays an important role in explaining market liquidity, nonetheless, the coefficient's sign is negative, contrary to our expectations. There could be several explanations for this phenomenon. Firstly, maybe the US is not the best benchmark for calculating cultural distance as it is a rather heterogeneous culture in itself, with not so much history defining it through time, and secondly, there could be some critiques of the methodology behind the composite index that measures cultural distance.

Table 3. Regression results of cultural dimensions on market illiquidity

	(1)	(2)	(3)	(4)	(5)
CD	-0.0101**				
	(-2.13)				
IDV		0.006**			
		(2.15)			
UAI			-0.0003*		
			(-1.80)		
MAS				-0.0005	
				(-0.35)	
PwD					-0.00016
					(-0.73)
LnGDP/cap	-0.02823***	-0.0314***	-0.0238***	-0.0242***	-0.0257***
	(-3.63)	(-3.65)	(-3.72)	(-3.44)	(-3.02)
ihhi	-0.0239	-0.0376	-0.0184	-0.0198	-0.0212
	(-0.86)	(-1.31)	(-0.59)	(-0.68)	(-0.72)
fhhi	0.0316*	0.0428**	0.0293	0.0304	0.0323*
	(1.87)	(2.22)	(1.47)	(1.63)	(1.71)
Ln(#comp)	00051	0.0063	0.0036	0.0056	0.0062
	(1.26)	(1.50)	(0.96)	(0.1.21)	(1.25)
GDP grwth vol	-0.0043*	-0.0021	-0.0072**	-0.0063*	-0.0057*
	(-1.65)	(-0.80)	(-2.27)	(-1.72)	(-1.74)
MV/GDP	-0.00006*	-0.00005*	-0.00007*	-0.00006*	0.00006*
	(-1.78)	(-1.74)	(-1.79)	(-1.78)	(-1.78)
Ln(size)	-0.0076***	-0.0073***	-0.0052***	-0.0060***	-0.0061***
	(-4.10)	(-4.26)	(-3.22)	(-3.69)	(-3.53)
Overall R^2	0.4670	0.4993	0.4517	0.4151	0.3462

Note: As some variables in our model are time-invariant, we use a random-effects model. Figures in parenthesis are t-statistics. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively

To research this sign reversal, we decided to decompose the cultural distance index into its components and run separate regressions for each of them. Re-running a regression for each of

the cultural dimension's components brings us interesting results. Specifications 3 to 5 which used Uncertainty Avoidance, Masculinity, and Power Distance have a negative coefficient sign, however, the only significant one is uncertainty avoidance. This finding is rather intuitive, as the higher the uncertainty avoidance between market participants, the more willing they are to abandon/change their position when changes occur, thus increasing trading volumes, and market liquidity. The beta coefficient for Individualism is significant and positive. This finding is contrary to our expectations (Chui, Titman and Wei 2010, Tan, Cheong and Zurbruegg 2019, Ma, Anderson and Marshall 2019). One explanation of this could be that individualist investors tend to focus more on privately held information, being over-confident in their knowledge, and could potentially ignore some market-wide signals. More research is required to confirm this hypothesis.

Overall, our findings are somewhat consistent with the academic literature in International Business, nonetheless, it is hard to draw conclusions in regards to the Financial area, as there haven't been any other studies analyzing the potential effect of psychic distance on the stock market liquidity.

5. Conclusion and Future Research

In his pursuit to diversify the portfolio, the nowadays investor, be he a retail or institutional one, seeks to expand his reach by going beyond his home country's borders. When choosing a market he will enter, the investor's decision is mainly defined by the following two factors: the macroeconomic context and his subjective perception of the country. There are certain stimuli behind the perception formation process as first defined in International Business Studies by Johanson and Vahlne (1977). In fact, those stimuli represent differences in culture, language, religion, education, political system, industrial development, and other factors such as colonial links and even time zones. Altogether, those differences are used to construct a composite index called psychic distance, meant to measure an individual's perception of the distance/differences between his home country and another country of interest.

Despite, this concept being widely used for over forty years in International Business Studies, to explain market selection decisions, international performance, the decision to export, entry mode choices, and a variety of other international phenomena, to our knowledge, we are the first to incorporate psychic distance as an exogenous variable in a stock market study.

Our findings are consistent with the research hypothesis. The regression results confirm that the higher the psychic distance of a country from the US, the less liquid is its stock market. The results remain robust even after controlling for market size, economic potential, macroeconomic stability, and market concentration. One reason behind this relationship is that the higher the value for psychic distance, the slower the know-how transfer between the country of origin (the USA) and the target country occurs. Another reason could be that the bigger the psychic distance between the origin and target country, the higher the costs for obtaining and interpreting information, leading to rising transaction costs. Moreover, the differences between countries' culture, language, education, and religion could diminish investors' trust levels and, potentially, increase the likelihood of misinterpreting information.

We would like to further extend this study through the inclusion of additional variables, such as institutional ownership, ethnic fractionalization, and other factors that could influence individuals' perceptions of target countries.

References

[1] Acharya, V., and L. Pedersen. 2005. „Asset pricing with liquidity risk." *Journal of Financial Economics* 375-410.

[2] Aggarwal, R., and J. W. Goodell. 2014. "National cultural dimensions in finance and accounting scholarship: An important gap in the literatures?" *Journal of Behavioral and Experimental Finance* 1-12.

[3] Aggarwal, R., C. Kearney, and Lucey B. 2012. "Gravity and culture in foreign portfolio investment." *Journal of Banking and Finance* 522-538.

[4] Ahern, K, D. Daminelli, and C. Fracassi. 2015. „Lost in translation? The effect of cultural values on mergers around the world." *Journal of Financial Economics* 165-189.
[5] Amihud, Y. 2002. „Illiquidity and stock returns: cross-section and time-series effects." *Journal of Financial Markets* 31-56.
[6] Barkema, H. G., J. H. Bell, and M. J. Pennings. 1996. "Foreign entry, cultural barriers, and learning." *Strategic Management Journal* (17(2)): 151–166.
[7] Beckerman, W. 1956. „'Distance and the pattern of Intra-European trade." *Review of Economics and Statistics* 38(1) 31–40.
[8] Blau, B. 2018. „ Does religiosity affect liquidity in financial markets?" *Journal of Behavioral and Experimental Finance* Vol.19 72-83.
[9] Blomkvist, K., and R. Drogendijk. 2013. „The Impact of Psychic distance on Chinese Outward Foreign Direct Investmens." *Management International Review* 53 659-686.
[10] Boyacigiller, N. 1990. „The Role of Expatriates in the Management of Interdependence Complexity and Risk in Multinational Corporations." *Journal of International Business Studies* 357-381.
[11] Brewer, P. A. 2007. „Psychic distance and Australian export market selection." *Australian Journalof Management* 32 73-94.
[12] Cho, K. R., and P. Padmanabhan. 2005. „Revisiting the role of cultural distance in MNC's foreign ownership mode choice: the moderating effect of experience attributes." *International Business Review* 307-324.
[13] Chui, A., S. Titman, and K. Wei. 2010. „Individualism and momentum around the world." *Journal of Finance* 361-392.
[14] Chung, K., and H. Zhang. 2014. „A simple approximation of intraday spreads using daily data." *Journal of Financial Markets* 94-120.
[15] Corwin, S., and P. Schultz. 2014. „A Simple Way to Estimate Bid-Ask Spreads from Daily High and Low Prices." *The Journal of Finance* 719-760.
[16] Debata, B., S. R. Dash, and J. Mahakud. 2017. „Investor sentiment and emerging stock market liquidity." *Finance Research Letter* 26 15-31.
[17] Dow, D. 2000. „A note on psychic distance and export market selection." *Journal of International Marketing* 8 51-64.
[18] —. 2008. „Factors Influencing Managerial Perceptions of Psychic Distance." Paper presented at the *34th European International Business Academy (EIBA) Conference*. Tallinn.
[19] Dow, D., and A. Karunaratna. 2006. „Developing a multidimensional instrument to measure psychic distance stimuli." *Journal of International Business Studies* 578-602.
[20] Dow, D., and J. Larimo. 2009. „Challenging the conceptualization and measurement of distance and international experience in entry mode research." *Journal of International Marketing* 74-98.
[21] Eun, C. S., L. Wang, and S. C. Xiao. 2015. „Culture and R2." *Journal of Financial Economics* 283-303.
[22] Fong, K., C. Holden, and C. Trzcinka. 2017. „What Are the Best Liquidity Proxies for Global Research?" *Review of Finance* 1355-1401.
[23] 2000. Freedom in the World. Accessed 06 13, 2020. http://www.freedom house.org/upload/FIWrank7502.xls.
[24] Gelfand, M., J. Raver, L. Nishii, L. Leslie, and J. Lun. 2011. „Differences between tight and loose cultures: A 33-nation study." *Science* 1100-1104.
[25] Giannetti, M., and Y. Koskinen. 2009. „Investor protection, equity returns and financial globalization." *The Journal of Financial and Quantitative Analysis* 135-168.
[26] Giannetti, M., and Y. Yafeh. 2012. „Do Cultural Differences Between Contracting Parties Matter? Evidence from Syndicated Bank Loans." *Management Science* 365-383.
[27] Gleditsch, K. S. 2003. Kristian Skrede Gleditsch // *Policy Data Archive*. Accessed 06 13, 2020. http://www.ksgleditsch.com/polity.html.
[28] 2020. Glossary. 13 June. https://databank.worldbank.org/metadataglossary/worldwide-governance-indicators/series/RL.EST#:~:text=Rule%20of%20Law%20captures%20perceptions.
[29] Gorodichenko, Y., and G. Roland. 2011. „Which Dimensions of Culture Matter for Long-Run Growth?" *American Economic Review* 492-498.
[30] Grinblatt, M., and M. Keloharju. 2001. „ How distance, language, and culture influence stockholdings and trades." *Journal of Finance* 1053-1073.
[31] Guiso, L., P. Sapienza, and L. Zingales. 2008. „Trusting the stock market." *Journal of Finance* 2557-2600.
[32] Harzing, A. W. 2002. „Acquisition versus greenfield investments: International Strategy and management of entry modes." *Strategic Management Journal* 211-227.
[33] Hasbrouck, J. 2004. „Liquidity in the Futures Pits: Inferring Market Dynamics from Incomplete Data." J*ournal of Financial and Quantitative Analysis* 305-326.
[34] Hasbrouck, J. 2009. „Trading Costs and Returns for U.S. Equities: Estimating Effective Costs from Daily Data." *The Journal of Finance* 1445-1477.
[35] Henisz, W. 2000. "The institutional environment for multinational investment." *Journal of Law Economics and Organization* (10 Vol. 16).

[36] Hofstede, G. 1980. „Culture and Organizations." *International Studies of Management & Organization* 15-41.
[37] —. 2001. Dimension data matrix. Accessed 10 24, 2018. https://geerthofstede.com/research-and-vsm/dimension-data-matrix/.
[38] —. 2018. The dimension scores in the Hofstede model of national culture can be downloaded here. 24 Oct. http://geerthofstede.com/research-and-vsm/dimension-data-matrix/.
[39] Ince, O., and R. B. Porter. 2006. „Individual equity return data from Thomson Datastream: handle with care." *Journal of Financial Research* 463-479.
[40] Johanson, J., and F. Wiedersheim-Paul. 1975. „The internationalisation of the firm: Four Swedish cases." *Journal of Management Studies* 305-322.
[41] Johanson, J., and J. E. Vahlne. 1977. „The internationalisation process of the firm: A model of knowledge development and increasing foreign market commitments." *Journal of International Business Studies* 23-32.
[42] Karolyi, A., K. Lee, and M. van Dijk. 2012. „Understanding commonality in liquidity around the world." *Journal of Financial Economics* 82-112.
[43] Kogut, B., and H. Singh. 1988. „The effect of national culture on the choice of entry mode." *Journal of International Business Studies* 411-432.
[44] Kose, M. A., E. S. Prasad, and M. E. Terrones. 2009. „Does openness to international financial flows raise productivity growth?" *Journal of International Money and Finance* 554-580.
[45] Kwok, C., and S. Tadesse. 2006. „National culture and financial systems." *Journal of International Business Studies* 227-247.
[46] Lee, C., and P. Chou. 2018. „Financial openness and market liquidity in emerging markets." *Finance Research Letters* 124-130.
[47] Lesmond, D. A., J. P. Ogden, and C. A. Trzcinka. 1999. „A new estimate of transaction costs." *The Review of Financial Studies* 1113-1141.
[48] Levine, R. 2005. „Finance and growth: theory and evidence." *Handbook of Economic Growth* 866-934.
[49] Levine, R., and S. Zervos. 1996. „Stock market development and long-run growth." *The World Bank Economic Revie*w 323-339.
[50] Li, K, D. Griffin, H Yue, and L Zhao. 2013. „How does culture influence corporate risk-taking?" *Journal of Corporate Finance* 1-22.
[51] Ma, R., H, Anderson, and B. Marshall. 2019. „Risk perceptions and international stock market liquidity." *Journal of International Financial Markets* 94-116.
[52] Marshall, B. R., N. H. Hguyen, and N. Visaltanachoti. 2013. „Liquidity measurement in frontier markets." *Journal of International Financial Markets, Institutions & Money* 1-12.
[53] Roll, R. 1984. „A Simple Implicit Measure of the Effective Bid-Ask Spread in an Efficient Market." *The Journal of Finance* 1127-1139.
[54] Schwartz, S. 2006. „A Theory of Cultural Value Orientations: Explication and Applications." *Comparative Sociology* 137-181.
[55] Shao, L, C Kwok, and O Guedhami. 2010. „National culture and dividend policy." *Journal of International Business* 1391-1414.
[56] Shenkar, O. 2001. „Cultural Distance Revisited: Towards a More Rigorous Conceptualization and Measurement of Cultural Differences." *Journal of International Business Studies* 519-536.
[57] Siegel, J. I., A. N. Licht, and S. H. Schwartz. 2011. „Egalitarianism and international investment." *Journal of Financial Economics* 621-642.
[58] Stöttinger, B., and B. Schlegelmilch. 1998. „ Explaining export development through psychic distance: Enlightening or elusive?" *International Marketing Review* 357-372.
[59] Stulz, R., and R. Williamson. 2003. „Culture, openness, and finance." *Journal of Financial Economics* 313-349.
[60] Tan, G., C. Cheong, and R. Zurbruegg. 2019. „National culture and individual trading behavior." *Journal of Banking & Finance* 357-370.
[61] 2016. Understanding the Relationship Between National Culture, Societal Effectiveness and Desirable Leadership Attributes. Accessed 06 13, 2020. https://www.globeproject.com/study_2004_2007.
[62] 2014. World Values Survey. Accessed 10 24, 2018. https://www.worldvaluessurvey.org/wvs.jsp.
[63] Zhao, H., Y. Luo, and T. Suh. 2004. „Transaction Cost Determinants and Ownership-Based Entry Mode Choice: A Meta-Analytic Review." *Journal of International Business Studies* 524-544.
[64] Zhou, N., and M. F. Guillén. 2015. „From home country to home base: A dynamic approach to the liability of foreign-ness." *Strategic Management Journal* 907-917.

6. Appendix 1. Psychic distance stimuli measurements. (Based on Dow and Karunaratna (2006))

Indicators
Language distance
Distance between major languages of countries
Incidence of i's major language in j
Incidence of j's major language in i
Distance between religions
Distance between major religions
Incidence of i's major religion in j
Incidence of j's major religion in i
Industrialization distance
Difference in GDP per capita between countries
Difference in energy consumption (equiv. kilogram coal per capita) between countries
Difference in cars per 1,000 people between countries
Difference in percentage of non-agricultural labour between countries
Difference in percentage of urban population between countries
Difference in newspapers per 1,000 people between countries
Difference in radios per 1,000 people between countries
Difference in phones per 1,000 people between countries
Difference in TV per 1,000 people between countries
Educational distance
Difference in percentage of adult literacy between countries
Difference in percentage in second-level education between countries
Difference in percentage in third-level education between countries
Democratic distance
Difference in POLCON between countries
Difference in Modif POLITY IV between countries
Difference in Freedom House Political Rights between countries
Difference in Freedom House Civil Liberties between countries

7. Appendix 2. Summary statistics

Country	# company	ilich	Psychic_dist	Cult_dist	trust	ihhi	fhhi	Discreq	gov_corr	GDP per capita	CB/GDP	deposit %GDP	internet users %
Argentina	57	0.0072	3.014	2.519	0.20	0.39	0.00	0.50	91.75	9,194	15.83	18.84	30.82
Australia	1357	0.0347	2.731	0.238	0.45	0.40	0.28	0.75	189.68	49,037	103.54	78.05	62.88
Austria	52	0.0078	1.354	2.371	0.33	0.20	0.03	0.25	186.18	44,823	25.70	73.00	56.84
Belgium	102	0.0109	1.087	2.407	0.31	0.41	0.10	0.42	182.63	42,408	67.55	91.56	55.46
Brazil	239	0.0200	4.308	2.881	0.06	0.25	0.00	0.25	104.25	10,059	48.50	45.61	28.81
Canada	729	0.0218	3.051	0.688	0.44	0.42	0.39	0.92	190.78	46,258	125.32	108.46	66.00
Chile	107	0.0053	3.255	3.803	0.20	0.22	0.01	0.58	174.41	11,844	98.76	44.87	36.91
China	1551	0.0001	9.516	3.451	0.54	0.40	0.00	0.38	98.57	3,686	54.06		21.65
Colombia	30	0.0026	4.267	3.652	0.12	0.24	0.04	0.42	100.65	5,877	47.36	19.54	24.55
Denmark	118	0.0053	0.638	2.933	0.59	0.23	0.02	0.58	198.71	57,489	53.47	52.94	70.55
Finland	106	0.0058	0.616	2.269	0.56	0.20	0.03	0.50	197.89	43,589	128.03	54.36	67.48
France	531	0.0125	0.599	2.462	0.22	0.18	0.02	0.75	179.81	39,761	76.92	69.11	50.29
Germany	367	0.0098	1.208	1.288	0.34	0.15	0.01	0.42	185.77	40,775	46.12	69.96	59.73
Hong Kong	1120	0.0108	3.051	3.034	0.41	0.16	0.00	0.92	189.30	29,058	731.23	256.90	55.49
Hungary	29	0.0300	1.970	2.092	0.27	0.54	0.00	0.48	141.56	12,509	20.61	42.06	42.88
India	1435	0.3137	8.522	2.443	0.35	0.17	0.02	0.92	94.71	1,156	77.03	51.79	8.26
Indonesia	418	0.0415	8.053	3.636	0.46	0.22	0.00	0.50	74.94	2,864	34.38	34.82	8.61
Ireland	25	0.0192	4.247	1.399	0.41	0.28	0.08	0.67	181.72	49,730	52.90	80.15	49.53
Israel	369	0.0200	2.927	2.545	0.23	0.17	0.01	0.67	164.95	29,176	65.88	75.03	42.88
Italy	213	0.0011	0.841	1.492	0.32	0.19	0.06	0.67	130.40	35,621	38.24	61.24	37.67
Japan	3265	0.0015	0.623	3.214	0.42	0.16	0.00	0.75	180.49	44,190	76.80	200.77	60.31
Korea, Rep.	708	0.0013	1.297	3.674	0.32	0.15	0.02	0.75	152.45	19,454	68.15	67.88	64.96
Malaysia	843	0.0162	4.190	3.980		0.14	0.02	0.92	143.02	8,503	143.73	109.87	44.61
Mexico	106	0.0128	4.912	3.447	0.24	0.21	0.00	0.58	101.22	9,078	29.56	23.09	24.42
Netherlands	86	0.0044	0.500	2.548	0.51	0.41	0.02	0.50	177.47	48,254	99.00	88.88	69.83
New Zealand	98	0.0162	3.310	1.116	0.50	0.16	0.00	0.67	195.31	32,631	37.22	82.54	64.12
Norway	126	0.0049	0.612	2.971	0.66	0.20	0.03	0.58	194.66	85,950	50.62	51.22	74.70
Pakistan	236	0.0966	9.373	3.376	0.27	0.19	0.03	0.58	47.04	985	22.59	28.85	6.87
Peru	50	0.0094	5.394	3.779						4,432	37.29		22.62

Country	# company	ilich	Psychic_dist	Cult_dist	trust	ihhi	fhhi	Discreq	gov_corr	GDP per capita	CB/GDP	deposit %GDP	internet users %
Philippines	223	0.0867	5.679	3.414		0.17	0.01	0.83	86.89	2,003	58.63	49.65	18.69
Poland	479	0.0285	2.699	2.661	0.23	0.24	0.00	0.47	140.00	11,047	26.16	39.99	40.28
Portugal	40	0.0381	1.796	4.025	0.17	0.20	0.04	0.42	163.72	21,642	36.34	81.43	39.26
Russian Federation	146	0.0355	2.633	4.028	0.28					9,141	41.02	25.51	30.00
Singapore	492	0.0274	4.159	3.684	0.15	0.26	0.05	1.00	196.96	41,521	199.41	104.60	
South Africa	232	0.0305	4.947	1.128	0.20	0.16	0.00	0.83	129.66	6,730	212.71	53.59	20.07
Spain	114	0.0009	1.730	2.633	0.33	0.53	0.43	0.50	163.20	29,643	74.83	81.54	46.43
Sri Lanka	243	0.1252	5.305	2.443		0.17	0.11	0.75	97.08	2,508	20.53	28.87	9.92
Sweden	327	0.0090	0.407	3.239	0.63	0.18	0.02	0.58	195.96	49,248	100.77	51.24	73.37
Switzerland	160	0.0019	0.680	1.122	0.44	0.13	0.01	0.67	195.26	71,330	213.15	131.14	66.22
Taiwan	841	0.0013	1.833	5.459		0.31	0.02	0.75	159.31				
Thailand	577	0.0365	5.259	3.461	0.42	0.23	0.08	0.92	108.22	4,563	65.06	96.86	18.52
Turkey	359	0.0025	4.809	3.090	0.11	0.20	0.05	0.50	119.55	10,360	26.47	35.55	26.64
UK	1079	0.0033	3.580	0.381	0.36	0.19	0.04	0.83	185.91	38,299	127.24		63.19
USA	1051	0.0000		0.000	0.41	0.12	0.02	1.00	180.40	47,559	128.68	70.18	60.17
Venezuela	15	0.0290	3.392	3.928	0.15					12,791		22.85	25.62