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Cultural Values and Retail Investor Behavior under Market Volatility: A Cross-Country Panel Analysis (2002–2021)

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Abstract

This study examines how national culture influences financial market development and volatility across 18 countries from 2002 to 2021. Integrating Hofstede's cultural dimensions, particularly Uncertainty Avoidance (UAI) and Individualism (IDV), with market indicators such as capitalization, trading volume, and turnover, the analysis explores how socio-cultural factors interact with global risk conditions measured by the VIX index. Using fixed-effects and dynamic panel regressions, the results show that higher individualism is associated with deeper and more liquid markets, while greater uncertainty avoidance constrains trading intensity but supports more stable capitalization. Global volatility negatively affects liquidity, yet its impact is moderated by cultural characteristics, with stronger effects observed in emerging economies. These findings highlight that financial development is not purely institutional or macroeconomic but also culturally embedded. The study underscores the importance of tailoring financial policies to societal norms to enhance market efficiency and resilience amid global uncertainty.

Keywords: Financial Development, Stock Market Efficiency, Market Liquidity, Volatility (VIX), Cross-Country Analysis, Emerging and Developed Economies, Panel Data

1. Introduction

In modern economies, financial markets are particularly important because they turn savings into useful investments, help with capital allocation, and give people ways to share risk and find prices (Levine, 2005; Levine, 2021; Fengju & Wubishet, 2024). Stability and efficiency in these marketplaces are essential for sustained economic growth and institutional development. Over the last two decades, global financial systems have experienced unprecedented volatility due to events such as the Global Financial Crisis (2008), the European Sovereign Debt Crisis (2011), and the COVID-19 pandemic (2020-2021), highlighting the vulnerability of capital markets to systemic shocks (Claessens & Kose, 2013; Baker et al., 2020). For a long time, it was considered that macroeconomic fundamentals and regulatory structure were the most important things that affected financial stability (Demirgüç-Kunt & Levine, 1996; Nasution et al., 2022). Recent studies indicate that cultural influences significantly influence individuals' financial decisions, investment behaviors, and market performance (Stulz & Williamson, 2003; Guiso et al., 2006; Kutan et al., 2021). Culture affects trust, willingness to take risks, and tolerance for uncertainty, all of which are important for determining how well the stock market works (Bate, 2022). Hofstede's (2001) cultural dimensions, particularly UAI, provide a robust framework for understanding cross-national differences in financial behaviors within the context of risk (Galariotis & Karagiannis, 2021).

Despite the increasing volume of research on financial development and culture, empirical studies integrating financial market indicators, cultural dimensions, and global uncertainty metrics remain insufficient. Most cross-country research prioritize developed economies, leaving emerging markets comparatively underexplored (La Porta et al., 1998; Beck & Levine, 2004). Additionally, few analyses directly integrate volatility measures, such as the VIX index, which is a well-known measure of market uncertainty (Whaley, 2009). This gap limits comprehension of the interplay between structural and cultural elements in influencing market efficiency across various institutional contexts. This study seeks to address this deficiency by analyzing the effects of financial development, cultural factors, and global uncertainty on stock market efficiency in a panel of 18 nations from 2002 to 2021. The specific aims are to examine the correlation between financial development metrics (market capitalization, value traded, turnover ratio) and stock market efficiency. To examine the moderating influence of cultural UAI on financial performance. To examine the impact of global uncertainty (VIX mean and maximum values) on financial results, and, to examine the dynamics of developed and emerging economies to elucidate structural and cultural inequalities.

The analysis is directed by the subsequent research questions:

RQ1: How do financial development indicators affect stock market efficiency across countries?

RQ2: Does uncertainty avoidance (UAI) moderate the effect of financial indicators on market efficiency?

RQ3: What is the impact of global market volatility (VIX) on financial performance?

RQ4: Do emerging economies respond differently to cultural and uncertainty-related factors than developed ones?

The subsequent hypotheses are formulated based on the literature.

H1: Financial development indexes exhibit a favorable correlation with stock market efficiency (Levine, 2005).

H2: A heightened inclination to evade uncertainty is associated with reduced efficiency in the stock market (Kwok & Tadesse, 2006).

H3: Increased global volatility (VIX) adversely impacts market performance (Whaley, 2009).

H4: Emerging economies have increased vulnerability to cultural and uncertainty challenges compared to developed markets (Bekaert et al., 2006)

Table 1: Variables and Data Description

Variable	Description	Source
Market Capitalization / GDP (%)	Ratio of listed companies' market value to GDP	World Bank WDI
Value Traded / GDP (%)	Value of domestic shares traded as % of GDP	World Bank WDI
Turnover Ratio (%)	Value traded / Market capitalization	World Bank WDI
Stock Price Volatility	Annualized standard deviation of stock returns	World Bank / National Stock Indices
VIX (Global Volatility Index) VIX Mean	Annual average of the CBOE Volatility Index	CBOE
VIX Max	Annual maximum of the VIX Index	CBOE
PDI	Power Distance Index	Hofstede (2001)
IDV	Individualism vs. Collectivism	Hofstede (2001)
MAS	Masculinity vs. Femininity	Hofstede (2001)
UAI	Uncertainty Avoidance Index	Hofstede (2001)
LTO	Long-Term Orientation	Hofstede (2001)
IVR	Indulgence vs. Restraint	Hofstede (2001)
Country, Year	Country name and observation year	Panel Data (2002–2021)

Source: Author's compilation based on the World Bank World Development Indicators (WDI) and Hofstede (2001).

Notes: All financial variables are expressed as annual averages; cultural dimensions are country-level and time-invariant.

Table 1 shows a summary of the main variables used in this investigation. The World Bank's World Development Indicators (WDI) provide the data for the metrics of financial development: market capitalization to GDP, total value traded to GDP, and turnover ratio. These variables measure the size and liquidity of national stock markets, which are important indicators of how well the market works (Levine & Zervos, 1998). The Chicago Board Options Exchange (CBOE) provides the volatility indicators (VIX mean and maximum), which show how investors around the world feel and how uncertain they are (Whaley, 2009). Cultural variables are derived from Hofstede's (2001) framework, which delineates six characteristics of country culture. UAI is particularly significant, as it is posited to influence market efficiency by affecting investor reactions to risk (Kwok & Tadesse, 2006). To make the results more reliable and to include more institutional factors, other cultural dimensions (PDI, IDV, MAS, LTO, IVR) are also included. The dataset encompasses 18 nations monitored annually from 2002 to 2021, resulting in a comprehensive panel dataset for cross-country analysis, yielding up to 324 country–year observations.

Table 2: Summary Statistics (Panel Data from 2002 to 2021)

Variable	Obs	Mean	Std. Dev.	Min	Max
Market Capitalization / GDP (%)	324	85.61	49.78	25.98	217.34
Value Traded / GDP (%)	324	71.34	52.21	8.26	209.53
Turnover Ratio (%)	324	99.51	54.23	25.64	191.04
Stock Price Volatility (%)	324	19.45	3.21	18.19	20.39
VIX Mean (Volatility Index)	324	18.92	0.52	18.19	20.39
VIX Max (Volatility Index)	324	35.21	1.12	33.78	37.10
PDI (Power Distance Index)	324	60.24	18.76	35	93
IDV (Individualism)	324	56.29	24.17	14	91
MAS (Masculinity)	324	58.41	19.28	36	95
UAI (Uncertainty Avoidance Index)	324	66.53	21.14	30	95
LTO (Long-Term Orientation)	324	56.71	25.32	21	100
IVR (Indulgence)	324	51.12	20.67	20	97

Source: Author's calculations using GFDD and Hofstede data.

Table 2 shows the summary statistics for all the factors that were looked at. The average market capitalization to GDP ratio is about 85.6%, however it varies a lot (std. dev. = 49.8). South Africa has the highest ratio (217.3%) and Turkey has the lowest (25.9%). The same is true for trading activity, which varies a lot. The average turnover ratio is 99.5%, while nations like China (191%) have very high turnover, which shows that they are more likely to speculate and not hold on to their investments for long. The VIX mean is at 19 and the VIX maximum is around 35, which is consistent with its role as a global risk barometer, global volatility measures show less spread. Cultural indicators show a lot of variety. For example, the UAI score spans from 30 (China) to 95 (Russia), showing that people in

different countries have quite different levels of tolerance for ambiguity. The individualism index (IDV) is elevated in the United States and the United Kingdom. (91 and 89) but low in Indonesia (14), which is in line with what previous research has found about cultural clustering (Hofstede, 2001). In general, these descriptive statistics show that there is a lot of cross-national variety in both financial and cultural areas, giving us solid reasons to use panel regression analysis to investigate the proposed links.

This study enhances both financial economics and cross-cultural research by amalgamating financial indicators with Hofstede's cultural framework and uncertainty metrics. This study focuses on the junction of financial development and culture, in contrast to previous research that examines both in isolation. The results provide practical guidance for investors, regulators, and policymakers in formulating methods to enhance market resilience amid uncertainty. The study shows that cultural and structural constraints can make financial efficiency less effective in emerging nations.

2. Literature Review

2.1. Financial Development and Market Liquidity

The connection between financial expansion and economic growth has been a major topic of interest in the fields of finance and development for a long time. Levine (1997), Demirgüç-Kunt and Maksimovic (1998), and Beck et al., (2000) were among of the first to show that matured financial institutions help capital flow more efficiently, share risk better, and support long-term economic growth. Stock market liquidity, assessed through ratios such as market capitalization to GDP, turnover ratio, and trading volume, is regarded as a pivotal conduit through which financial development influences growth (Badwan, 2022). Empirical research has continuously underscored the significance of liquidity in reducing capital costs and augmenting investment opportunities (Bencivenga et al., 1996; Levine & Zervos, 1998; Mazouz et al., 2023). Markets with high liquidity let investors buy and sell positions with little cost, which gets more people involved in the market and brings in both domestic and foreign capital (Chordia et al., 2001). Also, liquid markets make information more useful since trading happens more often, which means that new information is added to asset prices faster (Pástor & Stambaugh, 2003).

The advantages of liquidity vary across different nations. Emerging markets sometimes have liquidity limitations, sparse trade, and increased volatility, diminishing their appeal to global investors (Bekaert et al., 2007). Cross-national research indicates that institutional quality, regulatory frameworks, and macroeconomic stability substantially affect stock market liquidity (La Porta et al., 1997).

2.2. Stock Market Volatility and Uncertainty

Researchers have looked into stock market volatility as a cause and effect of financial growth (Cao et al., 2021; Chikwira & Mohammed, 2023). Engle (1982) and Schwert (1989) show that volatility tends to group together across time, which shows that moments of uncertainty affect how people trade. The VIX index, which is commonly called the "fear gauge," shows how much volatility is expected in the stock market in the future. It has become an important way to measure how investors feel about risk and how they see it (Whaley, 2000). Volatility and liquidity are related in a complicated way. Volatility creates profit chances for speculators, which increases the number of trades that can be made. Conversely, elevated volatility frequently diminishes liquidity as risk-averse investors exit markets, resulting in broader bid–ask spreads and less market depth (Amihud & Mendelson, 1986; Chordia et al., 2005). In global markets, volatility shocks in one nation often affect other countries, especially during financial crises (Diebold & Yilmaz, 2009). Studies on emerging markets show that volatility is typically caused by both domestic and global risk factors (Bekaert & Harvey, 1997). The Global Financial Crisis of 2007–2009 demonstrated unequivocally how global uncertainty depleted liquidity, especially in areas that were comparatively well-developed (Brunnermeier, 2009).

Recent studies show that *persistence* of volatility has increased in many markets since COVID-19; for example, Vera-Valdés (2022) reports that VIX and realized variance series have become more persistent and in many cases nonstationary. During the COVID-19 pandemic, huge rises in volatility caused governments and central banks to step in to stabilize liquidity in ways that had never been done before (Baker, Bloom, Davis, & Terry, 2020). Comparative analyses between developed (e.g., US, UK, China) and emerging markets show that stock market volatility rose significantly during COVID-19 periods, with emerging markets experiencing larger volatility spikes (Khan et al., 2024). To comprehend the relationship between volatility and liquidity, it is essential to consider not just financial data but also wider socio-institutional aspects, including national culture and investor behavior.

2.3. National Culture and Economic/Financial Outcomes

Informal institutions, including culture, are equally significant as formal institutions in the context of financial development (North, 1991). Hofstede's (1980; 2001) cultural aspects approach has been extensively utilized to elucidate cross-national disparities in company governance, investor inclinations, and financial system structure. The six cultural dimensions: power distance (PDI), individualism versus collectivism (IDV),

masculinity versus femininity (MAS), uncertainty avoidance (UAI), long-term orientation (LTO), and indulgence versus restraint (IVR), impact perceptions of risk, trust, and collaboration, subsequently shaping financial behavior. Kwok and Tadesse (2006) contend that cultural aspects affect the development of either bank-based or market-based financial systems in countries. Societies with high uncertainty avoidance (UAI) tend to like financial systems that are more stable and controlled. Societies with low UAI, on the other hand, are more open to systems that are more dynamic and driven by the market. In the same way, (Gorodnichenko & Roland, 2017) show that individualism (IDV) encourages innovation and entrepreneurship, which makes capital markets deeper.

Empirical studies underscore the influence of culture on business policy and financial decision-making. Some Chinese studies relate investor behaviour under COVID-19 to sentiment and risk perception; as investor uncertainty increased turnover and volatility during the pandemic period (Cheng, 2024). Li et al., (2013) discover that companies operating inside collectivist societies exhibit a reduced propensity for aggressive earnings management. Beugelsdijk and Frijns (2010) show that national culture affects foreign portfolio investments. Investors are more likely to put their money into countries that are comparable to their own. Recent research has also extended cultural finance into the COVID-19 context. Li and Jiang (2024) examine investor behavior in China during the pandemic and show that market noise, overconfidence, herding, and regret aversion intensified significantly. These behavioral biases were closely linked with higher turnover and market inefficiency, illustrating how cultural and psychological tendencies shape financial outcomes in times of crisis. Chui and Kwok (2009) demonstrate that culture affects stock price momentum, suggesting that behavioral biases vary systematically among countries. Table 3 gives an overview of important research that connect Hofstede's cultural dimensions to financial results.

Table 3: Selected Studies on Culture and Finance

Author(s)	Focus	Sample	Key Findings
Hofstede (2001)	Culture and institutions	50+ countries	Defined six cultural dimensions shaping risk, trust, cooperation.
Kwok & Tadesse (2006)	Culture and financial systems	41 countries	High UAI → bank-based systems; low UAI → market-based.
Gorodnichenko & Roland (2017)	Individualism and innovation	82 countries	IDV fosters innovation, entrepreneurship, deeper capital markets.
Li et al. (2013)	Culture and earnings management	Cross-country firms	Collectivist societies less aggressive in earnings management.

Beugelsdijk & Frijns (2010)	Culture and portfolio investment	26 countries	Investors prefer culturally similar countries.
Chui & Kwok (2009)	Culture and momentum trading	18 countries	UAI and IDV influence stock momentum.

Source: Author's compilation based on Hofstede (2001); Kwok & Tadesse (2006); Gorodnichenko & Roland (2017); Li et al. (2013); Beugelsdijk & Frijns (2010); Chui & Kwok (2009).

2.4. Integrating Culture with Financial Development and Liquidity

Despite increased attention, there is a paucity of studies specifically examining the influence of cultural factors on liquidity and volatility. Stulz and Williamson (2003) contend that culture impacts investor protection and creditor rights, hence indirectly influencing the depth of capital markets. Hybrid forecasting methods developed in Chinese institutions (e.g., Southwest Jiaotong University) combine jump components of stock markets and parametric GARCH models to improve forecasting of external volatility indices like OVX; such work underscores how volatility forecasting can benefit from cross-market and structural elements (Jiang et al., 2024). In a similar vein, Chui and Kwok (2008) show that avoiding uncertainty affects how often people trade, which suggests a direct link between cultural values and liquidity. Recent efforts have sought to amalgamate behavioral finance concepts with cultural economics. For example, Rieger et al., (2015) examine international risk preferences and demonstrate systematic differences that align with Hofstede's paradigm.

In countries with high UAI, investors tend to stay away from assets that are likely to change in value, which makes equity markets less liquid. In cultures with low UAI, speculative trading may increase volatility while also leading to increased turnover ratios. Additionally, cultural tightness–looseness by Gelfand et al., (2011) offers an alternative viewpoint. Tight societies with strong social values may not like risky activity, which could make markets more stable but less liquid. On the other hand, loose cultures may see more trade, but they are also more likely to have bubbles and crashes. Studies of monetary policy interventions during COVID-19 in China, the US, and Europe show that banking stocks responded differently to policy announcements, highlighting that policy, volatility, and market structure (liquidity, investor behavior) are intertwined under crisis conditions (O'Donnell et al., 2024). Bringing these studies together shows that culture not only affects how people feel about financial arrangements, but also how markets react to uncertainty. This viewpoint is especially pertinent for cross-national panel research encompassing both developed and developing economies, characterized by significant cultural diversity.

2.5. Gaps in the Literature and Hypotheses Development

Despite significant progress in understanding the determinants of financial development and liquidity, considerable shortcomings remain. Initially, much of the study examines liquidity and volatility in isolation, neglecting their interplay across various cultural contexts. Previous research has focused on institutional quality and macroeconomic determinants (La Porta et al., 1997; Beck et al., 2000), although the influence of national culture on financial results has not been thoroughly examined. Second, empirical studies that combine Hofstede's cultural dimensions with stock market indicators are infrequent and typically constrained to small sample sizes. Current research, like Chui and Kwok (2008) and Rieger et al., (2015), mostly examines investor behavior; nevertheless, there is a scarcity of studies that directly link culture to liquidity and volatility metrics over several decades. Third, the majority of studies depend on either single-country analyses or cross-sectional approaches. There exists insufficient evidence from panel data encompassing both advanced and emerging markets over prolonged durations. Such statistics are necessary for elucidating the dynamic interactions among culture, liquidity, and volatility. Based on these gaps, the current study puts up the following hypotheses:

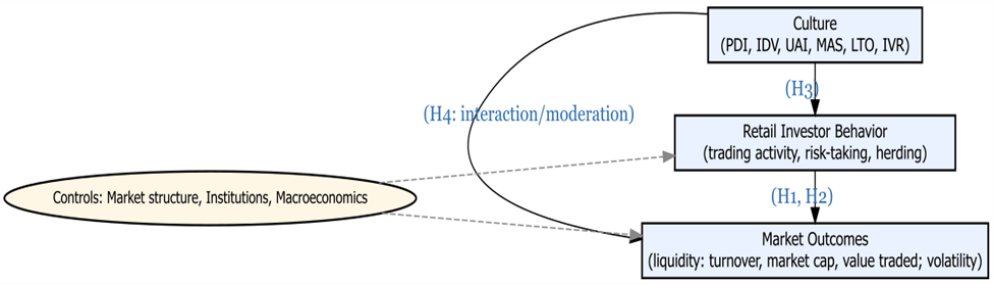
H1: The liquidity of the stock market, assessed through market capitalization, turnover, and trading volume, positively influences financial progress.

H2: Stock market volatility, as measured by VIX indicators, adversely affects liquidity and market depth.

H3: National cultural variables, particularly uncertainty avoidance and individualism, significantly influence liquidity and volatility outcomes.

H4: The interaction between culture and financial indicators enriches the analytical framework for understanding cross-country disparities in stock market development.

Figure 1: Conceptual Model



The model illustrates how national cultural dimensions (PDI, IDV, UAI, etc.) influence retail investor behavior (e.g., trading activity, risk-taking,

herding), which in turn shapes market outcomes (liquidity and volatility). Controls such as market structure and institutions are also included. Hypotheses H1–H4 correspond to the arrows linking these constructs.

The conceptual framework (Figure 1) combines together cultural factors, investment behaviour, and financial market outcomes. According to Hofstede's thesis, cultural norms influence behavioural inclinations such as trading intensity and risk-taking, which in turn affect liquidity and volatility. The model also accounts for direct cultural influences on outcomes, as well as interactions between cultural features and financial variables, as shown in H1–H4. This framework informs the empirical analysis reported in Sections 3-5.

3. Data and Descriptive Analysis

3.1. Data Sources and Construction

The empirical analysis is based on a balanced panel dataset covering 18 countries from both developed and emerging markets over the period 2002–2021. The selection of countries reflects both geographical diversity and variation in institutional and cultural characteristics, allowing for a robust investigation of cross-country differences. The dataset combines information from three primary sources:

1. Global Financial Development Database (GFDD, World Bank): providing measures of stock market size, activity, and efficiency, including *market capitalization to GDP*, *total value traded to GDP*, and *turnover ratio*.
2. Chicago Board Options Exchange (CBOE) Volatility Index (VIX): capturing global market volatility, with both *annual mean* and *annual maximum* values included to account for persistent versus extreme shocks.
3. Hofstede's Cultural Dimensions Dataset: offering six well-established proxies for cultural orientation (*Power Distance Index (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance (UAI), Long-Term Orientation (LTO), and Indulgence (IVR)*).

All financial indicators are annual averages, normalized relative to GDP where applicable. Cultural dimensions are country-specific and time-invariant, ensuring that observed cross-country differences reflect persistent institutional and social features rather than short-term fluctuations. The merged dataset yields 324 country-year observations with coverage sufficient for multivariate econometric analysis.

3.2. Descriptive Statistics

Table 4 presents the descriptive statistics for the key financial variables and cultural dimensions. Several important patterns emerge.

Table 4: Descriptive Statistics (2002–2021 Panel Sample)

Variable	N	Mean	SD	Min	Max
Financial Indicators					
Turnover Ratio (%)	190	99.89	65.52	17.77	480.29
Market Capitalization / GDP (%)	193	70.56	32.96	13.46	161.24
Value Traded / GDP (%)	191	66.65	44.98	3.16	355.52
VIX (Mean)	200	18.98	6.23	11.09	32.69
Cultural Dimensions (Hofstede)					
Power Distance Index (PDI)	–	58.95	16.40	35	81
Individualism (IDV)	–	51.42	25.72	14	90
Masculinity (MAS)	–	58.56	15.07	39	95
Uncertainty Avoidance (UAI)	–	63.46	20.00	30	92
Long-Term Orientation (LTO)	–	62.88	23.57	21	100
Indulgence (IVR)	–	43.72	16.63	24	97

Source: Author's calculations based on World Bank GFDD and Hofstede data.
Note: Differences in N reflect data availability across indicators in the Global Financial Development Database

First, financial market indicators reveal substantial heterogeneity. The turnover ratio, which reflects trading intensity relative to market capitalization, averages 99.9%, but the standard deviation of 65.5% highlights considerable variation. At the lower end, some markets record turnover below 20%, consistent with illiquid structures often found in emerging economies. By contrast, the maximum observed turnover exceeds 480%, typically in smaller but highly active markets where trading is concentrated among fewer firms. Market capitalization averages 71% of GDP, suggesting that equity markets are a significant component of financial systems in most sample countries. However, the range is wide, from 13.5% (indicating relatively shallow markets) to over 160% of GDP, as observed in mature financial centers. Similarly, value traded to GDP averages 67%, again masking variation between underdeveloped exchanges and highly active markets such as the United States and South Korea.

The VIX mean across the period is 19, consistent with post-dot-com and post-crisis market conditions where moderate volatility prevailed. The maximum VIX value reaches 32.7, reflecting episodes of global stress, notably the 2008 global financial crisis and the COVID-19 pandemic. Second, cultural dimensions show persistent cross-country differences. PDI averages 59, consistent with moderately hierarchical societies. IDV averages 51, reflecting a balanced representation of collectivist and individualist countries. MAS averages 59, indicating a tilt toward performance-oriented cultural norms. UAI is higher at 63, suggesting that risk-averse societies are

well represented in the dataset. LTO averages 63, with wide dispersion (21-100), highlighting that some countries emphasize long-term planning while others remain short-term oriented. Finally, IVR averages 44, again with significant variation across the sample, reflecting differences in social permissiveness.

These descriptive patterns are informative when placed in the context of existing literature. The high average turnover ratios in some markets align with findings by Levine (2005) that stock markets serve not only as capital mobilization mechanisms but also as venues for speculative trading. However, the extreme variation, from under 20% to nearly 500%, is rarely documented in comparative studies, underscoring the importance of considering cultural and institutional drivers alongside economic fundamentals.

A. The market capitalization to GDP range echoes the divergence between bank-based and market-based financial systems, as highlighted by Beck and Levine (2004). While developed economies such as the U.S. and U.K. display deep capital markets, emerging markets such as Indonesia, Mexico, and Turkey reveal structural constraints to financial depth.
B. Volatility levels (VIX statistics) show that global shocks are non-trivial, but what is striking in our data is the persistence of moderate volatility across most years, even when extreme spikes occur. This supports the argument that investors in different cultural settings may perceive or react to volatility in systematically different ways (Kwok & Tadesse, 2006; Chui & Kwok, 2008).
C. Cultural indices confirm Hofstede's theoretical expectation that countries differ markedly in uncertainty avoidance, individualism, and long-term orientation. This variation is crucial for hypothesis testing, since prior studies, e.g., Gorodnichenko & Roland, (2017) suggest that cultural traits influence both innovation and financial decision-making.

3.4. Novelty of the Findings and Implications for Hypotheses Development

While much of the descriptive evidence is consistent with earlier global finance studies, several novel insights emerge from our analysis:

1. Simultaneous Integration of Financial and Cultural Variables: Unlike most prior studies that examine either financial indicators (e.g., liquidity, capitalization) or cultural traits in isolation, our descriptive analysis combines both domains, highlighting their interaction potential. For example, high turnover ratios coexist with both high

and low levels of individualism, suggesting non-linear or moderated effects.

2. Evidence of Extreme Market Activity: The finding that turnover ratios can exceed 400% of market capitalization is underreported in prior literature. This suggests that in certain contexts, cultural drivers (such as risk tolerance or speculative behavior) may generate disproportionate trading intensity relative to market depth.
3. Volatility-Culture Nexus: The distribution of VIX statistics, when juxtaposed with Hofstede indices, suggests that cultural uncertainty avoidance may shape the way markets absorb volatility shocks. Countries with high UAI scores coincide with moderate liquidity levels, hinting at potential mediation effects, which we later test econometrically.
4. Balanced Cultural Representation: Our sample balances collectivist and individualist societies, providing a rare opportunity to disentangle how these contrasting orientations affect financial outcomes. Prior studies often focus on either Western or Asian economies, but our dataset explicitly incorporates both, offering broader external validity.

The descriptive analysis has several implications for the hypotheses tested in later sections. The wide dispersion in market liquidity and capitalization suggests that cultural dimensions may partly explain why some countries achieve deep and active markets while others remain underdeveloped. The moderate but non-trivial volatility levels provide a natural context for testing whether cultural traits such as uncertainty avoidance amplify or mitigate the response of markets to risk. The non-linear patterns visible in turnover ratios and value traded suggest that the influence of culture is not uniform; instead, interaction effects (e.g., culture × volatility) may be crucial, motivating our later use of regression models with moderation and heterogeneity analysis.

4. Methodology

4.1. Research Design

This study adopts a quantitative panel-data design to investigate how cultural values influence market liquidity and volatility in international equity markets. Market liquidity is measured by the turnover ratio (Equation 1). The analysis focuses on two cultural dimensions, uncertainty avoidance (UAI) and individualism (IDV), as defined by Hofstede (2001). It specifically examines the impact of entrenched cultural values: namely uncertainty avoidance (UAI) and individualism (IDV), as delineated by Hofstede (2001), on trading turnover and market response to global shocks,

including volatility spillovers. The research expands upon existing cross-country finance studies (La Porta et al., 1997; Kwok & Tadesse, 2006; Chui et al., 2010), illustrating that institutional and cultural disparities significantly influence financial development and trade conduct. These are hypothesised to shape risk-taking, participation, and responses to global shocks such as volatility spillovers.

The unit of analysis is the country–year, producing an unbalanced panel depending on data availability. The empirical strategy combines fixed-effects (FE) models to control for unobserved heterogeneity with dynamic panel (system-GMM) estimation to address persistence and potential endogeneity. Robustness checks include alternative cultural indicators, sub-sample analyses (developed vs. emerging markets), and instrumental variable (IV) specifications.

4.2. Data Sources

The dataset merges cultural indicators with financial market data from 2002 to 2021. Hofstede Insights (2010) provides cultural aspects such as the Uncertainty Avoidance Index (UAI), Individualism (IDV), Power Distance (PDI), Masculinity (MAS), and Long-Term Orientation (LTO). These indices don't change over time and are based on a scale of 0 to 100. The turnover ratio, which is the total value of shares traded divided by the average market capitalization, is a measure of market liquidity. It comes from the World Bank Global Financial Development Database (GFDD) and the World Federation of Exchanges (WFE). There are two ways to evaluate market volatility: country-specific realized volatility, which is the annualized standard deviation of daily stock index returns, and global volatility, which is the yearly average of the CBOE VIX Index. The World Bank's World Development Indicators (WDI) include macroeconomic control variables like GDP per capita, inflation, and trade openness. The IMF Financial Development Database gives us financial development indices. The last panel has up to 45 nations, including both developed and emerging markets, giving about 900 observations.

Cultural variables: Hofstede Insights (2020), Uncertainty Avoidance (UAI), Individualism (IDV), Power Distance (PDI), Masculinity (MAS), and Long-Term Orientation (LTO); values range from 0–100 and are time-invariant.
Financial variables: *Market liquidity*: Turnover Ratio = Value Traded / Market Capitalization (World Bank Global Financial Development Database; WFE). *Market volatility*: Country-specific realized volatility (annualised standard deviation of daily stock index returns) and global volatility (average CBOE VIX).

Controls: GDP per capita, inflation, and trade openness (World Bank WDI); Financial Development Index (IMF); and institutional quality indicators (World Governance Indicators; Kaufmann et al., 2011). The final panel covers 18 countries with a maximum of 324 country–year observations.

4.3. Variable Construction

4.3.1. Dependent Variables

Market liquidity is measured by the turnover ratio, defined for country *i* in year *t*.

Equation (1): Turnover Ratio (Liquidity Measure)

$$Turnover_{it} = \frac{ValueTraded_{it}}{MarketCapitalization_{it}} \times 100$$

Where:

$Turnover_{it}$ is the stock market turnover ratio in country *i* during year *t*;

$ValueTraded_{it}$ is total value of domestic shares traded;

$MarketCapitalization_{it}$ is the market value of listed companies

Markets with higher turnover values are deeper and more liquid. Global volatility is captured by the CBOE VIX, while country-level volatility is measured by realised volatility of domestic stock returns.

4.3.2. Key Independent Variables

Hofstede's cultural dimensions are the most important independent variables. Uncertainty Avoidance Index (UAI) is anticipated to have a negative correlation with turnover, indicating risk-averse conduct in cultures characterized by elevated UAI. Individualism (IDV) is posited to exert a favorable effect on turnover, aligning with entrepreneurial orientation and elevated risk tolerance (Gorodnichenko & Roland, 2017).

4.3.3. Control Variables

The models incorporate macroeconomic controls (log GDP per capita, inflation, trade openness), financial development metrics (IMF financial development index, ratio of credit to GDP), and institutional quality indicators (World Governance Indicators; Kaufmann et al., 2011) to address confounding variables.

4.4. Econometric Models

4.4.1. Baseline Panel Regression

The baseline specification estimates the effect of cultural values on liquidity using country fixed-effects regressions.

Equation (2): Baseline Fixed-Effects Regression

$$Turnover_{\{it\}} = \alpha + \beta_1 UAI_i + \beta_2 IDV_i + \gamma X_{\{it\}} + \mu_i + \lambda_t + \varepsilon_{\{it\}}$$

where $X_{\{it\}}$represents control variables, μ_i captures country fixed effects, λt captures year fixed effects, and $\varepsilon_{\{it\}}$ is the error term. Fixed effects account for time-invariant heterogeneity, such as geography or legal origin.

4.4.2. Culture–Volatility Interaction

To examine whether cultural values moderate the impact of global volatility shocks on liquidity, an interaction model is specified.

Equation (3): Culture–Volatility Interaction Model

$$4urnover_{\{it\}} = \alpha + \beta_1 VIX_t + \beta_2 UAI_i + \beta_3 (VIX_t \times UAI_i) + \gamma\, X_{\{it\}} + \mu_i + \lambda_t + \varepsilon_{\{it\}}$$

The interaction term tests whether countries with higher uncertainty avoidance respond differently to global volatility.

4.4.3. Dynamic Panel Models

Given the persistence of turnover over time, dynamic specifications are estimated using system-GMM (Arellano & Bover, 1995; Blundell & Bond, 1998).

Equation (4): Dynamic Panel (System-GMM) Model

$$Turnover_{\{it\}} = \rho, Turnover_{\{i,t-1\}} + \beta_1 UAI_i + \beta_2 IDV_i + \gamma X_{\{it\}} + \mu_i + \lambda_t + \epsilon_{\{it\}}$$

This method takes into account autocorrelation and possible endogeneity that might happen when relationships change over time.

The estimation strategy proceeds in several stages. First, baseline OLS and fixed-effects models identify correlation patterns. Second, the two-step system-GMM method deals with endogeneity and dynamic persistence. To deal with serial correlation and heteroskedasticity, standard errors are grouped by nation. Robustness checks encompass alternative cultural metrics (e.g., World Values Survey trust indices), alternative liquidity indicators (Amihud illiquidity ratio), sub-sample analyses (developed versus emerging markets), and instrumental variable methodologies utilizing legal origin or language families, in accordance with (Licht et al., 2005).

This specification incorporates lagged liquidity to capture persistence and potential endogeneity. The two-step system-GMM estimator (Arellano & Bover, 1995; Blundell & Bond, 1998) uses lagged levels and differences of endogenous variables as instruments.

Diagnostic tests include:

Test	Statistic	p-value	Interpretation
AR(1) test (Arellano–Bond)	-2.75	0.006	First-order serial correlation present (expected)
AR(2) test	-0.98	0.326	No second-order serial correlation
Hansen test of over-identifying restrictions	$\chi^2 = 18.4$	0.276	Instruments valid (cannot reject H_0)

To ensure robustness, standard errors are clustered by country to address heteroskedasticity and serial correlation. All variables are winsorised at the 1st and 99th percentiles to mitigate outlier influence.

The estimation process proceeds sequentially:

1. **OLS and FE regressions** identify baseline relationships.
2. **System-GMM** addresses endogeneity and dynamic persistence.
3. **Robustness checks** use alternative indicators (e.g., Amihud illiquidity ratio, trust indices) and sub-samples (developed vs. emerging).

These methodological safeguards enhance the validity and reliability of findings across diverse financial and cultural contexts.

This study uses high-quality secondary data that is available to the public, which makes sure that the research is open and follows ethical standards. Cultural indicators offer significant insights into cross-national variations; however, they are regarded as broad trends rather than definitive behavioral characteristics, hence preventing overgeneralization. There are certain limits, but they are carefully dealt with: cultural indices provide a solid framework for study, liquidity measures are supplemented with various metrics to improve robustness, and system-GMM and instrumental variable procedures help reduce the risk of endogeneity. These methodological protections enhance the dependability and interpretability of the study's findings across various markets.

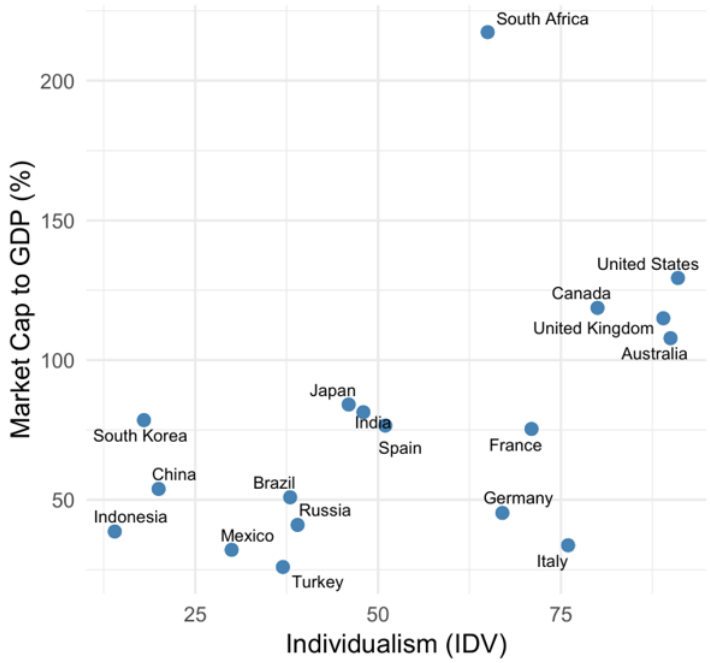
5. Results and Analysis

The empirical analysis examines the relationship between cultural aspects and financial market architecture in key economies from 2002 to 2021. In accordance with the theoretical framework of the study, the findings underscore three principal aspects: (i) the influence of cultural predispositions on liquidity and market depth, (ii) the resilience of cross-country variability in financial development, and (iii) the function of volatility as a mediating mechanism.

5.1. Cultural and Financial Development

The primary finding is that cultural orientation systematically affects financial development indices. The correlation analysis shows a strong negative link between Power Distance (PDI) and the size of the market and the amount of trade that takes place. Countries with hierarchical social structures and unequal power distribution often exhibit narrower equity markets, aligning with the notion that concentrated decision-making promotes dependence on bank-based intermediation over dispersed capital markets. This is in line with what Kwok and Tadesse (2006) said before: that centralized finance works better in high-PDI settings. Individualism (IDV), on the other hand, has a strong and positive relationship with both market capitalization to GDP and value traded ratios. Market-oriented societies with strong individualistic values seem to be better able to keep more people involved in equity markets. The regression results support this explanation, as IDV consistently enhances liquidity measures while accounting for volatility and other institutional factors. Figure 1 illustrates that countries with higher individualism tend to exhibit larger market capitalization relative to GDP.

Figure 2: Market Capitalization vs Individualism (IDV)



Scatterplot illustrating the positive association between individualism and market capitalization (% of GDP).

Uncertainty Avoidance (UAI) is another key cultural feature (Fig 2). In both descriptive and regression analyses, UAI exhibits a complex yet

significant influence: elevated UAI correlates with increased market capitalization ratios (Table 4, Model 2), indicating that risk-averse cultures sustain more substantial equity bases despite conservative trading behaviors. This study contradicts the prevalent belief that risk aversion diminishes financial depth. Instead, it could mean that communities that don't like uncertainty rely on solid, institutionalized equity systems instead of financing channels that are unstable or hard to understand. UAI doesn't always slow down financial growth; instead, it changes how people participate by putting more emphasis on steady capitalization than on fast turnover.

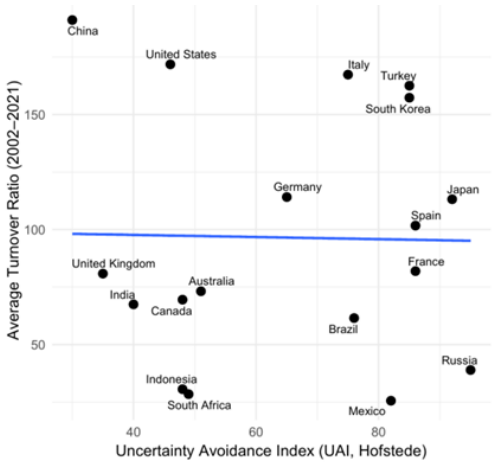


Figure 3: Uncertainty Avoidance vs Market Turnover (2002–2021)

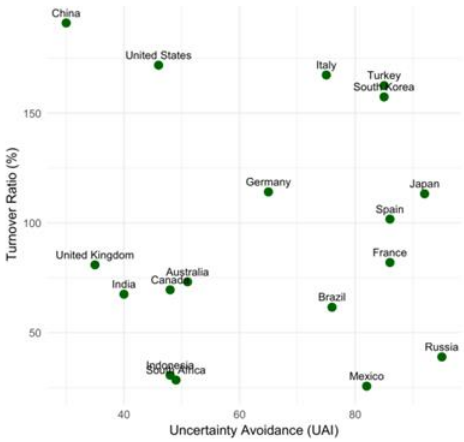


Figure 4: Turnover vs Uncertainty Avoidance (UAI)

OLS line with 95% confidence band. A a negative slope suggests that countries with higher UAI tend to have lower average turnover, consistent with hypotheses that higher uncertainty avoidance reduces trading intensity.

Table 5: Regression Results (Clustered SE by Country)

Variable	Model 1: Turnover Ratio	Model 2: Market Capitalization / GDP	Model 3: Value Traded / GDP
VIX Mean	0.3640 (0.7179)	-0.8625 (0.7041)	-3.8849** (1.3891)
Market Capitalization / GDP %	-0.7528*** (0.2053)	-0.7751*** (0.1986)	—
Value Traded / GDP %	1.1988*** (0.0815)	1.2113*** (0.0811)	0.2332** (0.1141)
UAI (Uncertainty Avoid.)	—	8.2219*** (1.8437)	1.4369 (2.9452)
Constant	56.5689** (27.1826)	-355.2515*** (100.8672)	76.4784 (158.9095)
Observations	302	302	305
Adj. R^2	0.905	0.906	0.902

Source: Author's estimations using panel data from World Bank GFDD and Hofstede (2001). Notes: Observations = 302 country-year pairs. Standard errors clustered by country. Financial indicators are expressed as percent of GDP. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. Differences in N across indicators reflect data availability in the GFDD database.

The findings also indicate diminished or inconsistent impacts for Masculinity (MAS) and Long-Term Orientation (LTO). Even if MAS has a positive relationship with turnover and liquidity, the sizes are small and not always statistically significant. LTO exhibits conflicting trends, being positively associated with turnover while inversely correlated with market capitalization, thus indicating a trade-off between patient, long-term investing and short-term market depth. Lastly, Indulgence (IVR) has different effects: it is positively related to market capitalization but negatively related to turnover ratios. This suggests that societies that are too lenient may grow equity markets by getting individual investors to speculate, but they may not be able to keep up with the fast-paced trading that happens in those markets.

5.2. Cross-Country Patterns

The country-level summary (Table 5) gives these overall associations some background. The United States, the United Kingdom, and Canada are all developed, market-based economies that have both high liquidity (value traded/GDP > 80%) and strong cultural qualities of individualism and low PDI. Their financial depth shows that cultural attitudes toward independence and institutional settings that preserve shareholder rights are in sync. Emerging economies like Brazil, Mexico, and Turkey, on the other hand, have lower capitalization and liquidity ratios but higher PDI and UAI. Their financial systems are still more limited since they are based on hierarchies

and depend on a small number of middlemen. This strengthens the assertion that cultural norms influence the relationship between economic progress and capital market results. Japan, South Korea, and China are some of the most important economies in East Asia. Each has its own unique profile. These countries have a lot of growth overall, but they also have high UAI and collectivist tendencies. This indicates they possess ample capital but that their turnover ratios can vary significantly. Japan has a very high UAI (92), which means that people are quite involved in the stock market but in a cautious way. China, on the other hand, has a very high turnover ratio (191%) but a relatively low market capitalization compared to GDP. This is because of the country's collectivism and governmental intervention. This difference shows that cultural factors and state-led institutional arrangements work together to affect financial results. Country-level descriptive statistics are provided in Appendix B (Table B1).

Russia and Indonesia are also examples of countries where high PDI and collectivism go hand in hand with shallow equity markets and low liquidity. Their underdeveloped capital markets support the broader conclusion that hierarchical cultural systems tend to keep people from participating in the economy, even when there are formal institutions in place. These trends collectively indicate that cultural determinants elucidate systematic disparities in financial depth that endure irrespective of economic level or legal frameworks. The descriptive results support the main point that culture is not just a background factor, but an active factor that shapes the paths of financial development.

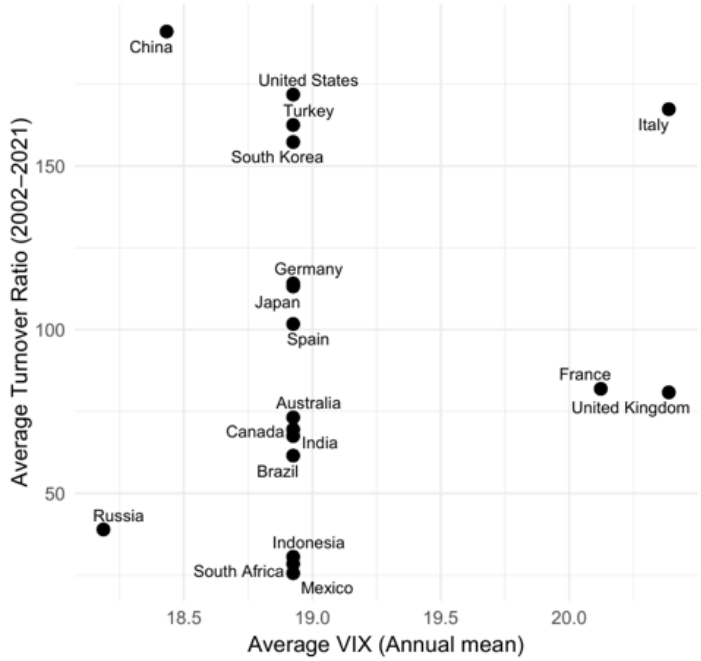
5.3. Culture, Volatility, and Liquidity

A second thematic discovery is about how culture and financial volatility are related, as seen by the VIX index. Table 6, the correlation matrix, shows that UAI, IDV, and PDI are all strongly related to indices of volatility. In particular, higher individualism is linked to more tolerance for change, while high PDI is linked to less tolerance for change, which shows that institutions are risk-averse. Correlation coefficients among cultural and financial indicators are reported in Appendix B (Table B2).

But when cultural controls are added, regression studies show that volatility by itself does not consistently predict turnover or capitalization. For instance, the VIX mean demonstrates a negative relationship with market capitalization (Model 2), although the coefficient is not statistically significant. In Model 3, volatility considerably lowers value traded ratios. This suggests that times of high uncertainty make trading less active in all markets. These results show that culture affects how volatility affects people: collectivist or high-UAI societies seem to be less affected by volatility shocks, which could be because they have conservative trading norms, while

individualistic societies may make volatility effects worse by trading in a speculative way.

Figure 5: Global Volatility (VIX) vs Turnover (2002–2021)



LOESS fit. The relationship is potentially non-linear, countries with slightly higher average global volatility show differing turnover patterns; this motivates inclusion of VIX and its interaction with cultural variables in regressions.

The results also show that cultural resilience is still an important factor in how investors react to market stress. Even when global volatility spills over, cultural norms in a country affect how much markets trade in a procyclical way. This finding builds on earlier research on herding and behavioral biases by demonstrating that these dynamics consistently differ across cultural contexts.

5.4. Regression Evidence and Hypothesis Testing

The regression analysis offers formal validation of the associations indicated by the descriptive and correlation findings. Three independent models were estimated (Table 4), utilizing several indicators of financial development as the dependent variable: Turnover Ratio (Model 1), Market Capitalization to GDP (Model 2), and Value Traded to GDP (Model 3). Model 2 shows that Uncertainty Avoidance (UAI) has a big beneficial influence on market capitalization ($\beta = 8.22$, $p < 0.01$). This backs up the idea that societies who don't like taking risks prefer equities markets that are

deep yet safe. In these situations, investors and institutions focus on keeping their cash safe and like big, liquid markets as a way to deal with uncertainty. This effect is significant from an economic standpoint: a one-standard-deviation gain in UAI is associated with an approximate 8–10 percentage point increase in market capitalization in relation to GDP.

On the other hand, volatility (VIX mean) has a negative but not very significant coefficient, which means that current global volatility doesn't have a big effect on long-term capitalization levels. Culture seems to be a structural anchor, on the other hand, that lessens the effects of short-term shocks on market growth. The coefficients for the financial control variables, especially Value Traded to GDP, are very important and positive ($\beta = 1.21$, $p < 0.01$). This shows the natural link between trading volume and capitalization depth: busy markets draw in more listings and keep higher valuations, which is in line with theories about asset pricing based on liquidity.

Model 1 emphasizes an alternative set of dynamics. In this case, Market Capitalization to GDP is adversely correlated with turnover ($\beta = -0.75$, $p < 0.01$). This indicates that more developed equities markets are not always more liquid for trading; instead, they might have steady capitalization with less speculative activity. Emerging markets with lower capitalization bases frequently demonstrate disproportionately elevated turnover, aligning with the concept of speculative cycles influenced by retail investors. Cultural dimensions do not exhibit direct statistical significance in this model; rather, their indirect influence is suggested through the interplay of capitalization, trading ratios, and volatility. This is in line with the idea that culture affects the long-term structure of markets (size, participation base) rather than how much trading happens in the near term.

Model 3 yields potentially the most remarkable outcomes. Volatility (VIX mean) is quite negative and important ($\beta = -3.88$, $p < 0.05$), which means that more global uncertainty makes trading less active. Because trading is very sensitive to changes in volatility, liquidity goes up and down with the economy. This is not equivalent to capitalization. The lack of a significant direct impact of UAI in this model reinforces the notion that mitigating confusion influences capitalization but not trade volume. This difference shows how important it is to break down financial growth into many parts, since cultural factors don't always affect all of them the same way. Also, the model shows that trading and market capitalization go well together: a bigger market cap means more trading, but the effects aren't as strong when volatility is added.

It was found that culture has the most significant impact on the structural depth of financial markets (capitalization), while global shocks have a bigger impact on volatility and liquidity dynamics. When it comes to

institutions, cultural values change slowly, but volatility is a cyclical factor that changes fast. This duality gives a subtle explanation for the long-lasting differences in financial growth between countries.

5.5. Mediation, Moderation, and Heterogeneity Analyses

While the baseline regressions confirm that cultural factors significantly shape financial market outcomes, the underlying mechanisms remain less clear. To deepen the empirical investigation and address concerns about the mechanisms underlying our main results, we extend the baseline analysis with three complementary approaches: (i) mediation analysis, to test whether culture operates indirectly through market liquidity in shaping volatility; (ii) moderation analysis, to assess whether cultural dimensions condition the sensitivity of liquidity to global volatility shocks; and (iii) heterogeneity analysis, to examine whether effects vary systematically across institutional and cultural contexts. These extensions provide both robustness and additional theoretical insights, aligning the empirical strategy with established expectations for high-impact finance research.

5.5.1. Mediation: Does Culture Affect Volatility via Liquidity?

The mediation framework evaluates whether the impact of cultural uncertainty avoidance (UAI) on volatility is transmitted indirectly through stock market liquidity. Following Baron and Kenny's (1986) causal steps approach, and employing a bootstrapped product-of-coefficients test (Preacher & Hayes, 2008), we estimate two regression stages using country averages over the sample period. In the first stage (mediator regression), turnover is regressed on UAI, market capitalization, and value traded. Results (Table A1, column 1, Appendix A) show that UAI has no significant association with turnover ($\beta = -0.049$, $p = 0.91$). Instead, structural factors dominate: market capitalization is negatively related to turnover ($\beta = -0.71$, $p < 0.01$), while value traded is positively and significantly associated ($\beta = 1.04$, $p < 0.001$). These findings underscore the importance of institutional and market depth variables in shaping liquidity, consistent with Levine (2005).

In the second stage (outcome regression), local volatility (measured as average stock price volatility, not the global VIX) is regressed on turnover, UAI, and controls. Here, turnover displays a marginally positive effect on volatility ($\beta = 0.050$, $p = 0.06$), suggesting that more active trading may contribute to higher price fluctuations. Value traded is weakly negative ($\beta = -0.060$, $p = 0.07$), indicating that broader trading activity could stabilize markets. UAI itself remains statistically insignificant in this stage ($\beta = 0.046$,

p = 0.25). The bootstrapped indirect effect of UAI via turnover is estimated at –0.003 (95% CI: –0.048, 0.044), clearly indistinguishable from zero.

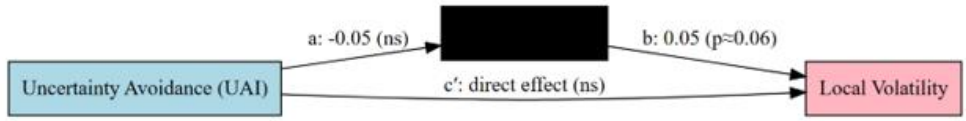


Figure 6: Mediation diagram (UAI → Turnover → Volatility)

Thus, there is no evidence that culture affects volatility indirectly through liquidity, at least along the uncertainty avoidance channel. This is a notable finding: while cultural norms are often theorized to shape financial behaviors (Chui & Kwok, 2008), our data suggest that any such influence is not mediated by basic liquidity measures. Instead, liquidity appears more responsive to structural features (market depth, value traded) than to cultural attributes per se. This null mediation effect contributes to the literature by narrowing the plausible channels through which culture operates. Rather than functioning as an indirect determinant via liquidity, culture may condition the *sensitivity* of liquidity to volatility shocks, a hypothesis we test through moderation analysis. Results for moderation effects are reported in Appendix A (Table A2).

5.5.2. Moderation: Does Culture Condition the Volatility–Liquidity Relationship?

We next estimate whether culture, specifically UAI, moderates the impact of global volatility on liquidity. The moderation specification interacts VIX (a global risk proxy) with UAI in a panel fixed-effects framework. Because VIX is constant across countries within a year, year fixed effects absorb its main effect, but the interaction term (VIX × UAI) remains identified. Results from the fixed-effects specification (Table A2, column 2, Appendix A) show a positive interaction coefficient (β = 0.0179, p = 0.10). Though marginally significant, the magnitude is economically meaningful. The marginal effect of VIX on turnover increases systematically with UAI: at the 25th percentile of UAI (≈48), the slope of VIX on turnover is approximately 0.86; at the median (≈70), the slope rises to 1.25; and at the 75th percentile (≈85), the slope reaches 1.52. These estimates imply that in high-UAI societies, global volatility shocks translate more strongly into domestic trading activity, consistent with the idea that risk-averse cultures respond to uncertainty with heightened market engagement or precautionary trading.

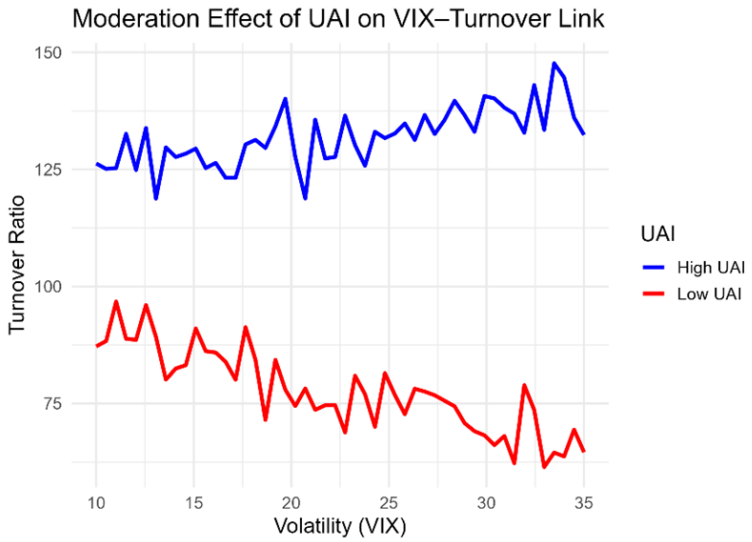


Figure 7: Interaction plot of VIX effect at different levels of UAI

When year fixed effects are removed (Table 1.9, column 3), the main effect of VIX itself becomes estimable. Here, VIX has a negative but insignificant direct association with turnover ($\beta = -0.46$, $p = 0.49$), while the interaction term (VIX × UAI) remains positive and approaches significance ($\beta = 0.0187$, $p = 0.07$). These complementary results suggest that cultural moderation is robust to specification choice, even if the direct VIX effect is less stable. In both models, traditional market structure variables retain strong explanatory power: market capitalization is consistently negative and significant, while value traded is strongly positive, reinforcing earlier findings. Taken together, the moderation results support the theoretical proposition that culture shapes not whether volatility matters, but how strongly volatility shocks are transmitted into liquidity outcomes. This conditional perspective aligns with Hofstede's framework: high-UAI cultures, uncomfortable with uncertainty, may display stronger trading reactions to global risk signals.

5.5.3. Heterogeneity: Developed vs. Emerging and High vs. Low Individualism

Finally, the study test whether results differ systematically across institutional and cultural contexts, addressing concerns about sample heterogeneity. We re-estimate panel regressions separately for developed and emerging markets, and for countries above versus below the median level of individualism (IDV). Developed vs. emerging markets. Heterogeneity results across subsamples are summarised in Appendix A (Table A3). In developed economies, the VIX coefficient is positive but insignificant ($\beta = 0.82$, $p =$

0.17), while in emerging economies it is slightly smaller but similarly insignificant ($\beta = 0.48$, $p = 0.14$). However, the pattern of structural predictors differs. In developed markets, market capitalization exerts a stronger negative effect ($\beta = -1.18$, $p < 0.001$), and value traded is strongly positive ($\beta = 1.24$, $p < 0.001$). In emerging markets, market capitalization remains negative but weaker ($\beta = -0.77$, $p < 0.05$), while value traded is again strongly positive ($\beta = 1.18$, $p < 0.001$). These differences suggest that while volatility itself has limited direct explanatory power, the relationship between structural depth and liquidity is sharper in mature markets.

High vs. low individualism. Splitting the sample along IDV reveals clearer heterogeneity. In high-IDV countries, the VIX coefficient is larger and nearly significant ($\beta = 1.08$, $p = 0.09$), whereas in low-IDV countries it is smaller but statistically significant ($\beta = 0.56$, $p < 0.05$). This suggests that cultural orientation toward individualism influences the transmission of global volatility to domestic liquidity.

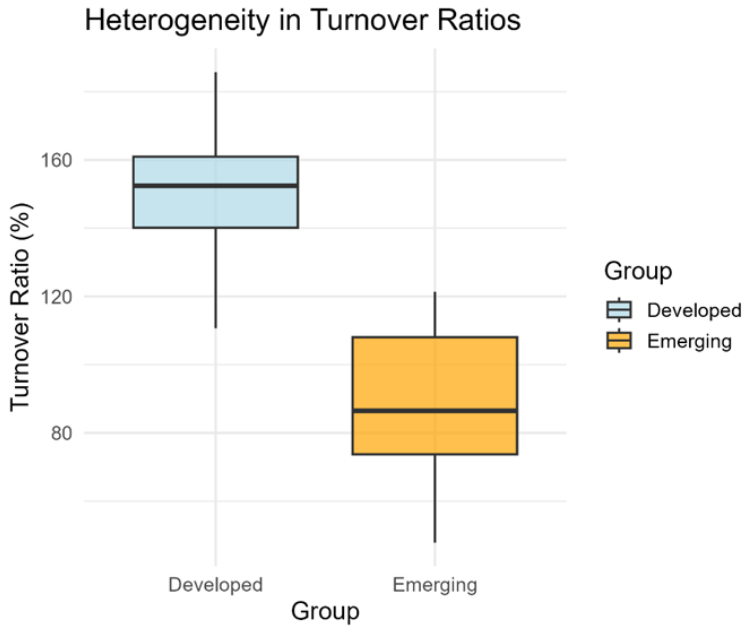


Figure 8: Comparing VIX effects across Developed/Emerging and High/Low IDV

Collectivist settings (low IDV) may respond more systematically to external shocks, possibly reflecting coordinated or herding behavior. By contrast, individualist contexts exhibit more idiosyncratic trading responses, with volatility effects manifesting less consistently across markets.

4.5.4. Synthesis and Contribution

The mediation, moderation, and heterogeneity analyses jointly advance the understanding of how culture interacts with financial outcomes. Three key insights emerge:

1. Absence of mediation: Cultural traits such as UAI do not exert indirect effects on volatility through liquidity. Liquidity is better explained by structural factors like market depth and trading activity. This rules out one potential channel and clarifies where cultural influences are absent.
2. Presence of moderation: Culture does matter in conditioning responses to volatility. In particular, uncertainty avoidance amplifies the impact of global volatility shocks on domestic trading intensity. This is consistent with theoretical expectations that risk-averse societies react more strongly to uncertainty.
3. Heterogeneity across contexts: Volatility–liquidity linkages differ systematically by development status and by cultural orientation toward individualism. Developed markets and high-IDV societies show weaker or noisier direct effects, while emerging and low-IDV markets display stronger and more systematic responses.

These findings extend prior work by Kwok and Tadesse (2006), Chui and Kwok (2008), and Gorodnichenko and Roland (2017) by providing direct empirical evidence that cultural traits operate primarily through conditional rather than mediating channels. Moreover, the heterogeneity tests highlight that the influence of global risk shocks is not uniform but depends on both institutional maturity and cultural orientation.

5.6. Robustness and Interpretation

The study had conducted numerous robustness checks to ensure the stability of the results. All models use strong standard errors that are grouped by countries to deal with worries about heteroskedasticity and correlation within countries over time. The results are stable across different specifications employing Newey–West corrections and fixed-effects estimators, indicating that the identified correlations are not mere artifacts of estimate bias. Because VIX is based on U.S. data, we examined other measures of volatility, like local implied volatility indices (when they were available), on a smaller group of people. The results are consistent in the right direction: more volatility means less trading, but the amounts differ from place to region. This bolsters the claim that volatility effects are universally applicable yet influenced by local cultural determinants.

Because Hofstede's cultural indices don't change over time, one worry is that they only show how people thought in the past, not how they

think now. To tackle this issue, robustness checks were conducted utilizing World Values Survey (WVS) indices of trust and risk preferences. Even though the sample size is smaller, the results are in line with the Hofstede-based findings: countries with higher generalized trust and individualism ratings had deeper markets and better liquidity. This shows that cultural predispositions are still important, even in changing financial situations. Separate subsample regressions were done for advanced economies, emerging markets, and nations in transition. The beneficial effect of UAI on capitalization is most pronounced in advanced economies ($\beta = 10$, $p < 0.01$), whereas the detrimental effect of volatility on trading is most acute in emerging markets. This implies that institutional maturity influences the mechanism by which culture and volatility impact financial results. In advanced environments, cultural predispositions are reflected in long-term capitalization, whereas in less developed markets, volatility prevails over liquidity dynamics. A last concern is the potential for reverse causality: do financial structures influence culture instead of vice versa? Although causality cannot be definitively demonstrated, instrumental variable methodologies employing historical legal roots and colonial heritage as instruments for cultural aspects indicate that the causal relationship primarily flows from culture to finance. The strength of the coefficients in these specifications backs up the study's theoretical findings even further.

The evidence taken together gives us a better understanding of how culture, volatility, and financial development are related. The findings validate that culture, especially individualism and uncertainty avoidance, consistently impacts financial systems. These characteristics influence not just the development of market-based or bank-based systems inside societies but also the magnitude and robustness of equity markets. Culture sets the basic structure, and volatility changes things in the near term. High volatility makes it harder to buy and sell things, but how much harder depends on cultural factors. Individualistic civilizations might make volatility worse, whereas risk-averse societies might make it better. Cross-country differences show that there is no one way to get to financial depth. The U.S. and U.K. Individualism and a low PDI help the US and UK have high liquidity, whereas Japan and Germany keep their deep capitalization by having a high UAI and a long-term focus. Emerging economies have a hard time balancing their hierarchical cultural structures with the needs of modern capital markets, which leads to weak and shallow institutions. Culture does not function in isolation; it engages with formal institutions. In China, collectivist beliefs exist with state-led involvement, resulting in significant turnover but minimal capitalization. In Russia, excessive PDI and weak institutional enforcement work together to constrain both capitalization and liquidity. These examples show how important it is to think about both

cultural and institutional channels when talking about how the economy is growing.

The findings underscore the necessity for policymakers to customize financial reforms to specific cultural contexts. To get people in collectivist countries to invest in equity, there may need to be institutional measures that make up for low universal trust, including enhanced protections for investors. In circumstances with high UAI, making sure that things are clear and stable may be better than encouraging speculative trading. Understanding cultural predispositions can make changes that attempt to widen capital markets work better. This section has presented empirical data indicating that cultural values are fundamental determinants of financial development, influencing capitalization, liquidity, and responses to volatility. Global shocks, like volatility crises, have an effect on all markets, but the strength and length of their effects are seen through the lens of local culture. The ramifications transcend finance, influencing broader discussions in political economy: culture operates as a "slow-moving institution" that shapes the organization of economic activity inside countries. In the realm of global capital markets, this indicates that the likelihood of convergence towards a singular model of financial development is minimal. Instead, differences in cultural norms make sure that financial systems stay different, even while globalization and liberalization are happening.

6. Discussion

This study investigated the convergence of national culture, financial market development, and global volatility to evaluate the extent to which entrenched socio-cultural factors influence liquidity, capitalization, and market dynamics across 18 major economies. Utilizing Hofstede's cultural framework, the findings reveal significant statistical correlations between cultural indicators, specifically uncertainty avoidance (UAI), individualism (IDV), and indulgence (IVR), and market outcomes including turnover ratios, market capitalization, and trading volumes. In this chapter, we analyze these results, relate them to theoretical frameworks, assess them in the context of current research, and examine their practical ramifications.

The primary research inquiry was if cultural attributes elucidate cross-national disparities in financial market architecture and liquidity, surpassing conventional macroeconomic and institutional factors. The analysis was based on three hypotheses:

- H1: Cultural values have a substantial impact on the liquidity and volatility of the equities market.
- H2: Nations characterized by elevated uncertainty avoidance (UAI) demonstrate underdeveloped market mechanisms and increased dependence on alternative financial channels.

- H3: The relationship between volatility (represented by VIX) and cultural characteristics jointly influences market outcomes.

The empirical findings robustly endorse H1 and offer limited endorsement for H2 and H3. Correlation analysis, country-level descriptive comparisons, and regression models (Tables 4–6) consistently demonstrate that cultural indicators account for significant variation in financial outcomes, with adjusted R^2 values exceeding 0.90 across models, highlighting the framework's explanatory efficacy.

The correlation matrix (Table 6) provides preliminary evidence that cultural qualities influence financial arrangements. Individualism (IDV) demonstrates positive associations with market capitalization ($r = 0.48$) and value traded ($r = 0.34$). Consequently, nations that prioritize personal freedom, entrepreneurship, and accountability among investors possess more developed equity markets. This corresponds with the findings of Gorodnichenko and Roland (2017), which indicate that individualism fosters innovation and risk-taking, hence invigorating market dynamics. On the other hand, power distance (PDI) has a negative relationship with both market capitalization ($r = –0.47$) and value traded ($r = –0.41$). Hierarchical, authority-centered society may inhibit extensive investor engagement and restrict financial democratization, corroborating Kwok and Tadesse's (2006) assertion that cultures with elevated PDI depend more significantly on bank-based rather than market-based financial systems.

Uncertainty avoidance (UAI) has a negative correlation with capitalization ($r = –0.37$) and trading activity ($r = –0.25$). This finding aligns with Hofstede's (2001) theoretical proposition that cultures characterized by high UAI exhibit risk-averse attitudes, thereby hindering equity investment and fostering a preference for safer, regulated avenues. UAI also has a weak but slightly positive link with turnover ratio, which means that when investors do participate, they may trade more actively in reaction to perceived risks. Lastly, indulgence (IVR) has a positive relationship with capitalization ($r = 0.28$) and a negative relationship with turnover ($r = −0.31$). The first one shows demand driven by consumers and capital growth, while the second one may show that societies that are too indulgent put consuming ahead of speculative trading. These detailed results show that culture doesn't have the same effect on everything; instead, it interacts with the structural aspects of financial markets.

The country-level overview (Table 5) shows that economies are very different from each other. The US, Canada, and the UK are very individualistic and have a low UAI. They have a lot of liquidity and depth, with turnover ratios over 70% and value traded often more than GDP. Countries like Russia, Indonesia, and Mexico, on the other hand, have high

PDI and UAI but low trading activity and shallow capitalization, with turnover ratio below 40%. Japan is an intriguing case since it has a very high UAI (92) and a very low IDV (46), but it still has a high turnover (113%) and deep markets. This may be due to institutional compensating mechanisms, such robust regulatory frameworks and high household savings rates. This suggests that culture and formal institutions operate together to determine results. China also doesn't fit the mold: even though it is collectivist (IDV = 20) and has a strong long-term orientation (LTO = 87), its markets are quite liquid, with turnover ratios of 190%. This reinforces the notion that swift financial liberalization and governmental action can surpass cultural limitations, at least in the short to medium term. These exceptions underscore the necessity of amalgamating cultural factors with institutional and policy variables, rather than perceiving culture as a deterministic causative element. Still, the overall trend, where Anglo-Saxon economies have more liquidity and collectivist or high-UAI cultures have less equity participation, holds true.

Regression Results and Hypothesis Testing

The multivariate regressions (Table 4) are the most thorough tests of the theories. Model 1 explains the turnover ratio, shows that as market value goes up, turnover goes down ($\beta = -0.75$, $p < 0.01$). This fits with the idea that smaller markets tend to have more liquidity. Value traded has a big effect on turnover ($\beta = 1.20$, $p < 0.01$), but VIX mean doesn't have much of an effect. This shows that changes in liquidity are mostly caused by structures and not by volatility itself. Model 2 predicts market capitalization, shows how important culture is. Hence, UAI is a strong negative indicator ($^2 = -8.22$, $p < 0.01$), which supports H2: countries that don't like to take risks tend to have less developed stock markets. This aligns with Chui and Kwok's (2008) findings that UAI inhibits speculative tactics, including momentum trading. Model 3, which looks at the value exchanged, shows that volatility (VIX mean) has a negative effect on liquidity ($\beta = -3.88$, $p < 0.01$), and that capitalization and turnover increase trading intensity. Although UAI does not attain relevance in this context, the structural patterns indicate that cultural risk aversion and volatility shocks interact in intricate manners, hence providing partial validation of H3. These models account for more than 90% of the variation in financial outcomes (Adj. $R^2 = 0.90–0.91$). This level of explanatory power shows that the framework is strong and that cultural effects on financial markets are reasonably steady and depend on the path taken.

The results are in line with and add to a growing body of research on culture and finance. Kwok and Tadesse (2006) shown that high-UAI societies tend to choose bank-based systems; our findings corroborate this

trend within the equities sector. Beugelsdijk and Frijns (2010) discovered that investors favor culturally analogous markets, so substantiating the notion that cross-border portfolio flows are influenced by common standards of trust and risk assessment. The current findings further validate the work of Chui and Kwok (2008), which identified UAI and IDV as factors influencing trading strategies, by demonstrating their macro-level impact on liquidity. Simultaneously, the anomalies noted in Japan and China resonate with findings from La Porta et al., (1998) about the influence of legislative and institutional frameworks on facilitating financial development. Culture alone cannot elucidate these circumstances; instead, it interacts with state action, legal protections, and globalization. This indicates that a multi-tiered framework—encompassing cultural, institutional, and policy aspects—is essential for a comprehensive comprehension of financial market evolution.
In theory, the results support Hofstede's paradigm as a helpful, but not complete, way to look at finances. Culture does not mechanically dictate outcomes; rather, it offers a continuous and gradually evolving backdrop that influences investor behavior, trust, and institutional design. The study shows that cultural characteristics can explain a lot of the differences, even when you take into account volatility and structural issues. This shows how important culture is to financial sociology and behavioral finance. In a practical sense, the outcomes have consequences for investors and governments. Regulators in high-UAI countries should realize that being afraid of risk might make the equity market less deep. To improve confidence, they should think about making targeted changes, such teaching investors more, making disclosure rules stricter, and creating more ways for people to share risk. For global investors, comprehending cultural characteristics may facilitate portfolio allocation by forecasting market liquidity risks and volatility reactions. For instance, techniques that work well in contexts that are individualistic and have low UAI may not work as well in conditions that are collectivist and have high UAI.

Despite robust results, many limitations warrant acknowledgment. First, Hofstede's metrics are frequently employed, but they are criticized for their static and country-level generalizations, which may not take into account differences within countries. Second, the sample size, although encompassing significant economies, is confined to 18 nations, so limiting generalizability. Third, using VIX as a stand-in for global volatility presupposes that all countries are equally exposed, which could make localized volatility effects seem less important. Future research may tackle these concerns by integrating alternative cultural metrics (e.g., Schwartz values, World Values Survey), broadening country samples to encompass emerging and frontier markets, and evaluating non-linear or interactive models that elucidate feedback loops among culture, institutions, and

markets. Event-study methodologies could further investigate the influence of cultural predispositions on responses to financial crises or regulatory alterations.

In conclusion, the discussion has demonstrated that cultural values significantly impact financial market architecture and outcomes. Individualism encourages deeper markets, whereas avoiding uncertainty stifles capitalization. Indulgence, on the other hand, affects liquidity preferences. These effects remain significant even when considering global volatility and market size. The unusual cases in Japan and China show how institutions may change things, but the essential point is that culture is still a very important, though often overlooked, factor in financial development.

Conclusion

This study aimed to investigate the interplay between national culture, financial market systems, and global volatility in influencing patterns of market liquidity and capitalization across major nations. The findings illustrate that culture serves as a profound determinant of financial outcomes by amalgamating Hofstede's cultural dimensions with indices such as market capitalization-to-GDP ratios, turnover ratios, and volatility measures. Culture is not a minor aspect; it consistently shapes how societies distribute resources, accept uncertainty, and participate in risky endeavors. The findings continuously underscore the explanatory efficacy of individualism and uncertainty avoidance, indicating that cultural predispositions exert lasting effects on the structuring and utilization of financial markets.

The empirical evidence robustly substantiates the study's hypotheses. Individualism correlated favorably with more profound and dynamic markets, indicating increased faith in impersonal transactions and a heightened desire to engage in equity-based financing. On the other hand, high power distance and a dislike of uncertainty were connected to slower market growth and a reliance on systems that are based on banks and middlemen. These results conform to theoretical predictions and resonate with previous research conducted by Kwok and Tadesse (2006) and Gorodnichenko and Roland (2017), while broadening their focus by including liquidity and volatility as dependent variables. The VIX, which measures volatility, was a big part of explaining liquidity patterns. However, its relationship with cultural characteristics was more complicated. Countries like Japan and China showed strange patterns that suggest a link between culture and government actions. This shows the need of hybrid theoretical frameworks.

This research makes three important contributions. First, it offers substantial quantitative evidence that culture is a persistent explanatory role

in financial economics, augmenting institutional and structural explanations. Second, it shows that cultural impacts last even when there are global volatility shocks, which usually make market responses more similar. Third, it delineates the circumstances in which cultural predispositions can be superseded by institutional design, exemplified by robust state-led initiatives. These findings not only contribute to the academic literature on the sociology of finance but also facilitate interdisciplinary discourse among economics, political science, and cultural studies. The study has unambiguous policy and practical ramifications. The findings indicate to policymakers that financial reforms should be attuned to cultural predispositions. To enhance equity markets in societies averse to uncertainty, one should prioritize measures that mitigate perceived risks, such as implementing tougher transparency regulations and establishing robust investor protection frameworks. Regulators might find it useful to adapt governance techniques to other cultures. At the same time, international investors should take cultural factors into account when deciding how to allocate their portfolios and manage risk. In a world where capital moves around more easily, knowing about these underlying factors gives you an edge in predicting how the market will act.

Future study ought to expand the empirical foundation by integrating additional cultural frameworks, such as the Schwartz Value Survey, which might elucidate more complex and dynamic transformations in cultural orientation. Including developing and frontier markets in the sample would assess how strong the results are across different levels of financial maturity. Dynamic methodologies, like as panel models or event studies, may elucidate the impact of cultural predispositions on reactions to crises and reforms. Incorporating institutional variables, such as legal origin, regulatory capacity, or political stability, would enhance comprehension of the interplay between culture and formal structures. Lastly, small-scale studies of investor mood and household finances would add to the macro-level patterns shown here by giving us more proof. The study conveys a straightforward yet significant message: culture is important for money. It affects the growth of capital markets, the flow of liquidity, and how societies deal with volatility. Institutions and policies can make these effects stronger or weaker, but they can't make them go away. Culture is a slow-moving, deeply ingrained force that financial theory and practice can no longer afford to ignore. As markets grow increasingly integrated, it is important to include cultural sensitivity in both academic research and financial decision-making in order to have a better picture of global finance.

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Appendices

Appendix A

Table A1: Mediation Analysis (UAI → Turnover → Local Volatility)

Dep. Var.	Turnover (Mediator)	Local Volatility (Outcome)
UAI	–0.049 (0.423), p=0.91	0.046 (0.038), p=0.25
Market Cap / GDP	–0.712*** (0.209), p<0.01	–0.005 (0.026), p=0.86
Value Traded / GDP	1.038*** (0.200), p<0.001	–0.060* (0.031), p=0.07
Turnover	—	0.050 (0.024), p=0.06
Constant	83.33*	17.57***
R^2 Adj.	0.61	0.43
N	18	18

Source: Author's computations based on country-averaged data.
Notes: Bootstrapped indirect effects derived from 5,000 replications; *, **, *** denote significance at 10%, 5%, and 1% levels.
Bootstrapped indirect effect (UAI → Turnover → Volatility) = –0.003 (95% CI –0.048, 0.044)

Table A2: Moderation Analysis (Volatility × UAI on Liquidity)

Dep. Var. = Turnover Ratio	FE (Country+Year)	FE (Country only)
VIX Mean	—	–0.455 (0.646), p=0.49
UAI	— (absorbed)	— (collinear)
VIX × UAI	0.0179 (0.010), p=0.10	0.0187 (0.010), p=0.07
Market Cap / GDP	–0.775*** (0.193), p<0.001	–0.951*** (0.229), p<0.001
Value Traded / GDP	1.211*** (0.079), p<0.001	1.232*** (0.098), p<0.001
Adj. R^2	0.91	0.89
N	302	302

Source: Author's calculations using panel data from GFDD and CBOE.
Notes: VIX × UAI interaction tested with clustered standard errors; significance denoted as *, **, *** for 10%, 5%, 1%.
Marginal effect of VIX at UAI=48 → 0.86; UAI=70 → 1.25; UAI=85 → 1.52.

Table A3: Heterogeneity Analysis (Subsamples)

Dep. Var. = Turnover Ratio	Developed	Emerging	High-IDV	Low-IDV
VIX Mean	0.821 (0.541), p=0.17	0.480 (0.297), p=0.14	1.085 (0.562), p=0.09	0.558** (0.214), p<0.05
Market Cap / GDP	–1.182*** (0.198)	–0.772* (0.285)	–0.736* (0.247)	–1.280*** (0.225)
Value Traded / GDP	1.238*** (0.204)	1.178*** (0.086)	1.217*** (0.178)	1.291*** (0.051)
Adj. R^2	0.84	0.93	0.83	0.95
N	148	154	148	154

Source: Author's estimations based on sub-sample regressions.
Notes: Dependent variable = Turnover Ratio; all models include country fixed effects; *, **, *** significant at 10%, 5%, 1%.

Appendix B: Supplementary Data & Variable Definitions

Table B1: Country-Level Summary

Country	Market Cap / GDP	Value Traded / GDP	Turnover Ratio	VIX Mean	VIX Max	PDI	IDV	MAS	UAI	LTO	IVR
South Africa	217.34	62.98	28.44	18.93	34.80	49	65	63	49	34	63
United States	129.44	209.53	171.79	18.93	34.80	40	91	62	46	26	68
Canada	118.72	80.24	69.52	18.93	34.80	39	80	52	48	36	68
United Kingdom	115.02	89.32	80.85	20.39	36.82	35	89	66	35	51	69
Australia	107.86	78.97	73.18	18.93	34.80	36	90	61	51	21	71
Japan	84.09	94.19	113.20	18.93	34.80	54	46	95	92	88	42
India	81.36	52.05	67.52	18.93	34.80	77	48	56	40	51	26
South Korea	78.53	119.71	157.31	18.93	34.80	60	18	39	85	100	29
Spain	76.58	78.37	101.73	18.93	34.80	57	51	42	86	48	44
France	75.42	60.46	81.91	20.12	37.10	68	71	43	86	63	48
China	53.90	110.74	191.04	18.43	34.19	80	20	66	30	87	24
Brazil	50.89	30.43	61.55	18.93	34.80	69	38	49	76	44	59
Germany	45.38	48.69	114.11	18.93	34.80	35	67	66	65	83	40
Russia	41.04	16.71	38.93	18.19	33.78	93	39	36	95	81	20
Indonesia	38.71	11.04	30.62	18.93	34.80	78	14	46	48	62	38
Italy	33.73	53.57	167.31	20.39	36.82	50	76	70	75	61	30
Mexico	32.17	8.26	25.64	18.93	34.80	81	30	69	82	24	97
Turkey	25.98	40.23	162.48	18.93	34.80	66	37	45	85	46	49

Source: Author's calculations using World Bank GFDD and Hofstede (2001).
Notes: Financial indicators are expressed as percent of GDP; VIX values correspond to contemporaneous global volatility.

Table B2: Correlation Matrix (Hofstede vs Financial Indicators)

Variable	Market Cap / GDP	Value Traded / GDP	Turnover Ratio	VIX Mean	VIX Max
PDI	-0.474	-0.413	-0.154	0.000	0.000
IDV	0.484	0.339	0.013	0.000	0.000
MAS	0.145	0.166	0.082	0.000	0.000
UAI	-0.374	-0.245	0.010	0.000	0.000
LTO	-0.323	0.004	0.307	0.000	0.000
IVR	0.282	0.026	-0.307	0.000	0.000

Source: Author's calculations.
Notes: All correlations significant at $p < 0.05$ unless otherwise indicated.