INTERNATIONAL EVIDENCE ON THE EFFECT OF ECONOMIC POLICY UNCERTAINTY ON STOCK MARKET LIQUIDITY

by

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Presented to the Faculty of the Graduate School of

The University of Texas at Arlington in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

May 2021

To my husband, the ultimate source of my inspiration.

My parents (all four of them),

who always motivated me to move ahead, no matter how small my steps were!

And my kids Prisha and Pranay, who grew up so fast to cooperate with my weird schedule.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my most profound appreciation to my committee chair, Dr. Sanjiv Sabherwal, for his invaluable guidance and unparalleled support throughout this journey. I find myself highly fortunate and gratefully privileged to have worked under his effective supervision. His extensive knowledge, practical suggestions, constructive criticism, and excellent mentoring have been imperative in achieving this most important milestone of my academic life. His suggestions were never limited to my dissertation but will keep guiding me throughout my professional life.

My gratitude also goes to my committee members: Dr. Sriram Villupuram, Dr. David Rakowski, and Dr. Mahmut Yasar, for their insightful suggestions, encouragement, and prompt response. Despite their busy schedule, they were always ready to help me. Their subject expertise and positive attitude played an essential role in completing my dissertation. I sincerely hope to have long term academic relationship with them.

I would like to extend my sincere thanks to the Faculty of Department of Finance and Real Estate: Dr. Salil Sarkar, Dr. Dave Ditz, Dr. John Adams, Dr. Grace Hao, Dr. Tommy Thompson, Dr. Andy Hansz, and Dr. Yibing Du for their ever-available guidance and support. My special thanks go to Dr. Larry Lockwood, with whom we had an opportunity to have a class that marked a beginning of a lifelong relationship with an eminent scholar and a great human being.

I would also like to acknowledge the kind support from the administrative staff of the Department, Debbie, and Teresa, who were always there to facilitate me with the required resources. I am thankful to my fellow Ph.D. students and friends: Anh, Ankita, Elif, Nima, Aziz, Abdul, and Bani Hani, with whom I share lifelong memories of all the ups and downs of my Ph.D. life. I especially acknowledge all the help from my friend and fellow Ph.D. student Anh, for being

my tech support, when I had issues with my laptop. He had also been a motivator, coauthor, and most importantly, the living being besides me in the office.

It would be unfair if I do not acknowledge my family members' support and motivation, especially my two kids, who sacrificed a lot of fun and enjoyment that they deserved the most. I owe indebtedness to my Didi, Parveen Kadyan, and Bhai Sahib, Ajay Kadyan, who always stood by me like the pillars of strength. I could not finish this dissertation without the trust, unconditional love, and care that my family extended during this time.

Finally, I must express my profound gratitude to our Bauji, Ch. Sultan Singh ji, who is not with us anymore, but his teachings kept me highly encouraged throughout these years.

Thank you all for always being with me and keep me going!

ABSTRACT

INTERNATIONAL EVIDENCE ON THE EFFECT OF ECONOMIC POLICY UNCERTAINTY ON STOCK MARKET LIQUIDITY

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The University of Texas at Arlington, May 2021

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Degree: Doctor of Philosophy in Business Administration (Finance)

In this dissertation, I investigate the impact of economic policy uncertainty on stock market liquidity across a broad cross-section of countries. My dissertation is composed of three distinct yet related essays. My first essay examines the impact of economic policy uncertainty on stock liquidity and various firm-level cross-sectional variables explaining the uncertainty-liquidity relationship. The focus of the second essay, using a sample for non-U.S. stocks cross-listed in the U.S., is to examine the role of cross-listing in moderating the above impact. In the third essay, I examine the market liquidity and country-level factors that explain the relationship between economic policy uncertainty and market liquidity.

In the first essay, I investigate the impact of economic policy uncertainty on stock liquidity using an international sample of twenty-four countries spanning twenty-three years. The sample countries include fourteen developed and ten emerging countries. In this essay, I initially provide global evidence on the adverse impact of economic policy uncertainty (EPU) on stock liquidity. The result holds for all the countries in the sample except Croatia and Russia. Subsequently, I investigate the role of firms' information environment in explaining the uncertainty-liquidity relationship. Considering informational transparency and quality of information as two aspects of the information environment, I find that firm-level informational transparency plays a significant

role in mitigating EPU's effect on stock liquidity, whereas the quality of information does not.

In the second essay, I investigate whether cross-listing a non-U.S. stock in the U.S. reduces the detrimental impact of EPU on the liquidity of that stock. My sample of cross-listed stocks includes the stocks from twenty countries, cross-listed in the U.S. In this essay, I first examine how domestic and U.S. EPUs affect the domestic liquidity of cross-listed stocks relative to their non-cross-listed domestic counterparts. Based on the findings, I document that cross-listing helps mitigate the negative impact of economic policy uncertainty on stock liquidity—literature on cross-listing and liquidity documents that the impact of cross-listing on liquidity is contingent upon country characteristics. Using further analysis, I show that the role of cross-listing in mitigating the negative impact of EPU on domestic liquidity is contingent on home country characteristics. I provide evidence that cross-listing helps mitigate the negative impact for the stocks of developed strong governance countries but not for stocks of emerging and weak governance countries. The role of cross-listing in moderating the relationship between EPU and liquidity is stronger for common law countries relative to civil law countries.

In the third essay, I examine the impact of economic policy uncertainty on stock market liquidity. Using a broad sample of twenty-four countries, I focus on the country-level characteristics that affect the EPU-liquidity relationship. Specifically, I study the role of market segmentation, financial development, funding constraint, and the country's governance structure in shaping the above relationship. I find that a country’s financial development and its governance mechanism help mitigate EPU's negative effect on stock market liquidity. However, market integration, as captured through trade openness and political stability, worsen the impact.

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LIST OF ABBREVIATIONS

ADRs	American Depository Receipts
BNY	Bank of New York
BOJ	Bank of Japan
COVID-19	Corona Virus Disease 2019
CRSP	Centre for Research in Security Prices
EPU	Economic Policy Uncertainty
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product
GDRs	Global Depository Receipts
IBES	Institutional Brokers' Estimate System
IFRS	International Financial Reporting Standards
ISIN	International Securities Identification Number
ISO	International Organization for Standardization
KOSDAQ	Korean Securities Dealers Automated Quotations
MSCI	Morgan Stanley Capital International
Nasdaq	The National Association of Dealers Automated Quotations
NYSE	New York Stock Exchange
OTC	Over the Counter
PM	Prime Minister
RBI	Reserve Bank of India
REITs	Real Estate Investment Trusts
RI	Return Index
SEC	Security and Exchange Commission
SIC	Standard Industrial Classification
U.K.	United Kingdom
U.S.	United States
USD	United State Dollar
VIX	Volatility Index
WDI	World Development Indicators
WGI	World Governance Indicators

CHAPTER 1
INTRODUCTION

"The whole institutional structure of the marketplace rests on the assumption that the other side of the trade will always be there; without that assumption, even the gutsiest of market-makers would refuse to stay in business."

- ***Peter Bernstein***

Recently, the world has witnessed an unprecedented level of uncertainty due to the coronavirus (COVID-19) pandemic. It has not only affected our daily lives or public health system but has caused a shock to the whole business community internationally. Besides this pandemic, there are multiple events, such as political turmoil, Brexit deal, US-China trade war, Indo-Pak conflicts, US-Iran conflicts, or other government policy decisions that bring uncertainty to the operating environment of firms. This heightened uncertainty and its impact on corporations, investors, and other economic activities have forced practitioners and academics to think more about the effects of uncertainty.

There is extensive literature that examines the effects of economic policy uncertainty on different aspects of corporate decision-making, such as cash holdings, mergers and acquisitions, payout policy, investment policy, and capital structure policy, etc. However, only a few studies examine the impact of economic policy uncertainty on stock market characteristics, particularly stock market liquidity (a few exceptions include Zhang et al., 2021; Duong et al., 2018; Ma et al., 2019; Rehse et al., 2019; Dash et al., 2019; Chung and Chuwonganant, 2014). The main aim of my dissertation is to investigate the impact of economic policy uncertainty on liquidity in a global context.

I focus on the impact of economic policy uncertainty (EPU) on stock market liquidity for multiple reasons. First, liquidity is essential for investors as it ensures strategic investment

flexibility to the investors. Second, it is vital for corporate managers as it affects the cost of capital and ability to raise additional capital in the time of need. Third, overall liquid market ensures development by channeling the scarce resources (funds) of a country to their most efficient use. Overall, the liquidity dry-up can paralyze the whole financial system of a country. It is more crucial amid heightened uncertainty when different stakeholders are already skeptical about the outcomes of their decisions. It, therefore, becomes essential to understand the impact of economic policy uncertainty on stock market liquidity and identify different firm-level and country-level forces that can moderate this relationship.

In the first essay, using a sample of twenty-four countries (fourteen developed and ten emerging), I provide cross-country evidence on the detrimental impact of economic policy uncertainty on stock liquidity. Subsequently, I analyze different firm attributes that explain the EPU-liquidity relationship. The theoretical literature suggests that uncertainty increases the level of information asymmetry and thus affects liquidity. It, therefore, becomes interesting to understand how the information environment of the firm moderates this relationship. I focus on two categories of attributes about a firm's information environment, i.e., informational transparency and quality of information as the determinants of liquidity-uncertainty relationship. I show that firm-level informational transparency helps mitigate the negative effect of economic policy uncertainty on stock liquidity, whereas the quality of information does not.

In the second essay, using the sample of non-U.S. stocks cross-listed in the U.S. for twenty countries, I find that cross-listing helps mitigate the negative impact of domestic and U.S. EPU on domestic liquidity. I further document that the impact is contingent on home country characteristics. The findings of my study support the information disclosure hypothesis for

developed and strong governance countries, whereas for emerging and weak governance countries, market opaqueness dominates the firm-level information disclosure.

In the third essay, I examine the impact of EPU on market liquidity as opposed to the first two essays, where the focus is on stock liquidity. I further examine cross-country variations based on financial development, market integration, funding constraints, and the country's governance structure. I find that the impact is stronger for countries with funding constraints and having weak governance. Financial development helps to weaken the relationship between EPU and market liquidity. Amid heightened economic policy uncertainty, political stability does not help; instead, its impact is more pronounced in politically stable countries due to the unpredictability of changes.

My dissertation contributes to the scant literature on the effect of economic policy uncertainty on liquidity in four ways. First, I provide a global context to the literature on economic policy uncertainty and liquidity by using a broad sample of twenty-four countries. Second, my study documents the importance of firm-level informational transparency to help mitigate the detrimental impact of economic policy uncertainty on stock liquidity. Third, I add to the literature of benefits of cross-listing by documenting the role of cross-listing in mitigating the negative impact of economic policy uncertainty on stock liquidity. Fourth, I contribute to the literature on commonality in liquidity by showing EPU as a source of commonality in liquidity.

The rest of the dissertation is divided into four chapters. Chapter 2 analyzes the firm-level factors (informational transparency and quality of information) affecting the relationship between economic policy uncertainty and stock liquidity. Chapter 3 evaluates the role of the U.S. cross-listing to mitigate the detrimental impact of economic policy uncertainty on stock liquidity. Chapter 4 examines various country-level factors affecting the relationship between economic policy uncertainty and market liquidity, and Chapter 5 concludes.

CHAPTER 2

An Analysis of the Firm-Level Factors that Affect the Relationship Between Economic Policy Uncertainty and Stock Liquidity

Abstract

Stock market liquidity is a key driver of the financial system of a country. It ensures efficient utilization of assets through mobility. The current operating environment of corporates is full of uncertainty. There is extant literature examining the detrimental impact of uncertainty on different corporate decision-making aspects. However, very few studies investigate the effect of economic policy uncertainty on stock market characteristics, particularly liquidity. Also, the majority of these studies focus on the U.S. market. I use a broad sample of twenty-four countries from 1997-2019 and document a negative impact of economic policy uncertainty on liquidity. I also perform cross-sectional tests for the firm-level determinants of liquidity and find that informational transparency plays a significant role in mitigating the negative impact of policy uncertainty on stock liquidity, whereas the quality of information does not. The findings are robust to the use of alternative measures of liquidity, and further investigation confirms that the U.S. economic policy uncertainty does not drive the results.

JEL Classification Codes: *G10, G15, G18*

Keywords: *Stock market liquidity, Economic policy uncertainty, Informational transparency*

2.1 Introduction

The aftermath of the global financial crisis in 2007-2008 has made economic agents, such as consumers, investors, and firms, skeptical about the outcome of their decisions. This skepticism affects every facet of the economy. Nowadays, firms worldwide are operating in an uncertain environment due to a variety of reasons, such as political turmoil, Brexit deal, US-China trade war, Indo-Pak conflicts, US-Iran conflicts, COVID-19 spread, or various policy decisions of the Governments. This elevated level of uncertainty and its impact on the economy have forced practitioners and academics to think more about the effects of uncertainty. There is extensive literature that examines the effects of economic policy uncertainty on different aspects of corporate decision-making, such as cash holdings (Duong et al., 2020; Hankins et al., 2020; Phan et al., 2019), mergers and acquisitions (Duchin and Schmidt, 2013; Nguyen and Phan, 2017; Bonaime et al., 2018), innovation (Bhattacharya et al., 2017; Xu, 2020), payout policy (Attig et al., 2021; Tran, 2020); investment policy (Abel, 1983; Bernanke, 1983; McDonald and Siegel, 1986; Ingersoll and Ross,1992; Dixit et al., 1994; Novy-Marx, 2007; Gulen and Ion, 2016), and capital structure policy (Zhang et al., 2015; Li and Qiu, 2021), etc. However, only a few studies examine the impact of economic policy uncertainty on stock market characteristics, particularly stock market liquidity (a few exceptions include Zhang et al. 2021; Duong et al., 2018; Ma et al., 2019; Rehse et al., 2019; Dash et al., 2019; Chung and Chuwonganant, 2014).

Stock market liquidity is the lifeblood of any economy. The very existence of a stock market rests on the principle of the creation of market liquidity. Liquidity is the ability to move the assets to those entities that can hold and manage them most efficiently. Liquidity stimulates arbitrage activity and improves market efficiency (Chordia et al., 2008; Chung and Hrazdil, 2010a, 2010b; Wei, 2018). It relieves the initial investors from the commitment of carrying the risk indefinitely as a liquid asset can be sold quickly without a significant cost to transfer risk. Market

liquidity, therefore, appears to be an essential determinant of the investment environment. In the absence of sufficient liquidity, investors would be hesitant to assume risk indefinitely, thereby slowing down the whole process of capital formation. Lack of liquidity can cause economic slowdown and reduce national wealth.

On the other hand, improved stock market liquidity is associated with monetary expansion (Chordia et al., 2005). Liquidity is one of the priced risk factors, and the models that account for liquidity factors outperform the traditional models that consider only market factors in predicting future returns (Pastor and Stambaugh, 2003; Acharya and Pederson 2005; Bekaert et al., 2007).

The economic policy affects the behavior of economic agents such as firms and investors. Uncertainty regarding government actions brings uncertainty in the economic environment and affects financial market performance (Pastor and Veronesi, 2012). So, in this era of increasing financial integration and heightened uncertainty, it becomes particularly important for regulators, policymakers, and academicians, to analyze the cross-sectional differences in the impact of economic policy uncertainty on stock liquidity.

The literature examining the impact of economic policy uncertainty on market characteristics mainly focuses on the U.S. market. To the best of my knowledge, Ma et al. (2019) and Dash et al. (2019) are the studies using cross-country data to examine the relationship between risk and market liquidity. My study inherently differs from Ma et al. (2019) as I examine the impact of economic policy uncertainty using the EPU index as opposed to Ma et al. (2019) that focuses on investors' risk perception measured using the VIX index. Both Ma et al. (2019) and Dash et al. (2019) investigate the impact on market liquidity, whereas I examine the impact on stock liquidity. I fill the gap in the literature by providing broad international evidence on the cross-country and firm-level cross-sectional relationship of economic policy uncertainty and stock liquidity.

Providing international evidence is important mainly for two reasons: first, the international scope allows us to investigate the impact of different political, economic, and legal regulatory environments on liquidity; second, the variations in liquidity across countries are large enough to allow for valid cross-sectional tests.[1] The extended sample period of twenty-three years (1997-2019) enables me to assess the impact over time in different phases of the economy. This study also contributes to the literature on commonality in liquidity by showing economic policy uncertainty as a source of commonality in liquidity.

In this study, I predict a negative relationship between economic policy uncertainty and stock liquidity. My prediction is based on the argument that economic policy uncertainty increases the level of information asymmetry and theoretical models in the academic literature that predicts a lower level of liquidity with an increase in information asymmetry. Glosten and Milgrom (1985) and Kyle (1985), in their theoretical models, show that an increased level of information asymmetry in the market increases the risk of adverse selection. Therefore, liquidity providers or market makers demand higher compensation in terms of bid-ask spread for the additional adverse selection risk.

Consistent with the prediction and the prior literature, the findings of this study document a significant negative impact of economic policy uncertainty on stock liquidity at an international level. The results are robust to the use of different measures of liquidity. I use news based economic

[1] Liquidity as measured by cost of trading is consistently low in Paris Bourse while consistently high in South Korea (Willoughby, 1998). The variations in one-way equity trading cost ranges from as high as 198 basis points in Korea to as low as 30 basis points in France (Domowitz et al., 2001). According to a report on '*Global Equity Trading Cost Analysis'* by McKinley Capital Management, LLC, the spread is persistently tight in developed market compared to the emerging markets. https://www.mckinleycapital.com/global-equity-trading-cost-analysis/

policy uncertainty index by Baker et al. (2016) (henceforth EPU index) to measure economic policy uncertainty. One of the potential issues with using a news-based EPU index is that it might inadvertently capture the impact of other macroeconomic uncertainty, which might not be attributed to economic policy uncertainty. The results, therefore, might be driven by omitted variables. To address this issue, I control for other macroeconomic uncertainty measures following Bloom (2009) and Duong et al. (2020) and find consistent results.

Another potential concern with my analysis is the confounding impact of the U.S. economic policy uncertainty. One might argue that the U.S. economic policy uncertainty affects the economic policy uncertainty of other countries, so that the analysis might capture the impact of the U.S. economic policy uncertainty. To address this concern, I create a subsample except for the U.S. and use the U.S. economic policy uncertainty as a control variable. The results remain consistent even after controlling for the U.S. economic policy uncertainty.

In further cross-sectional analysis, I predict that if economic policy uncertainty negatively affects stock liquidity, this impact should be more pronounced for the industries which are more sensitive to economic policy uncertainty. Consistent with the conjecture, I find that the negative impact of economic policy uncertainty on stock liquidity is stronger for more sensitive industries. I also examine the EPU-stock liquidity relationship for individual countries in my sample and find consistent results for all the countries except for Croatia and Russia.

Focusing on informational transparency and information quality at the firm level, I investigate the firm-level cross-sectional forces that affect the uncertainty-liquidity relationship. My results provide evidence of a significant role of firm-level informational transparency in mitigating the detrimental impact of economic policy uncertainty on stock liquidity. In contrast, the results are not statistically and economically significant for the quality of information.

Additionally, I perform several tests to validate my results, including the use of alternative liquidity measures and subsample analysis for developed and emerging countries. The results are statistically and economically significant and are immune to the impact of the U.S. economic policy uncertainty.

The rest of the paper is organized as follows. Section 2.2 reviews the prior literature in this area and develops the hypotheses. Section 2.3 presents data and methodology, and in Section 2.4, I present the empirical results. Finally, I conclude the paper in Section 2.5.

2.2 Literature Review and Hypothesis Development

The theoretical work on liquidity and uncertainty suggests that uncertainty gives rise to illiquidity. Easley and O'Hara (2010), using Bewley's (2002) model of decision making under uncertainty, investigate the implications of uncertainty for liquidity. In their model, traders have incomplete preferences over their portfolios which implies that traders cannot rank order some of the portfolios due to the high level of uncertainty associated with outcomes of those portfolios. Therefore, the traders in such extreme conditions do not change their portfolio allocation unless it leads to an increase in expected utility. They offer an alternative (standard) explanation to market freeze during a financial crisis. They argue that during uncertain times the bid-ask prices are biased. In the presence of uncertainty, prices reflect the individual beliefs of best and worst outcomes rather than the average across individuals or possible outcomes. Bid-ask spread during this time is wider, reflecting the view of optimistic and pessimistic investors. Such bid-ask prices do not reflect the 'fair-value' standard; hence, the traders are unwilling to trade at almost any posted prices.

In other theoretical models of Ozsoylev and Werner (2011) and Routledge and Zin (2009), as uncertainty increases, the trading volume drops, and traders widen the bid-ask spread. In the

Ozsoylev and Werner (2011) model, informed traders receive a private signal that helps resolve the asset's payoff's ambiguity. In rational expectations equilibrium, arbitragers choose not to trade, thereby dropping trading volume. In the spirit of Routledge and Zin (2009), ambiguity-averse market makers widen the bid-ask spread under uncertainty to reduce the likelihood of trading. The theoretical literature suggests that the trading volume drops in uncertain conditions, and the bid-ask spread widens.

The findings of empirical literature that mainly focuses on the U.S. market confirm the theoretical predictions. Duong et al. (2018) find that economic policy uncertainty adversely affects stock market liquidity for the U.S. Their further analysis finds that the impact is more pronounced during the global financial crisis period. They identify three channels, including information asymmetry, cash flow risk, and funding liquidity, through which economic policy uncertainty reduces market liquidity.

Rehse et al. (2019), using hurricane Sandy as a natural experiment, confirm the detrimental impact of uncertainty on stock liquidity. They use difference-in-difference analysis and provide evidence of reduced liquidity for Real Estate Investment Trusts (REITs) with properties in the evacuation zone compared to the REITs without properties in the evacuation zone. Specifically, they find a relatively low level of trading and wider bid-ask spreads for REITs with properties in uncertainty-affected areas than their counterparts without properties in those areas.

Chung and Chuwonganant (2014) show that market uncertainty, as measured by the VIX index, is an important source of commonality in liquidity. They also show that the effect of market uncertainty is greater than the combined effect of the other determinants of liquidity. Using the different market structures of NYSE and Nasdaq, they highlight the role of market structure in defining liquidity uncertainty relationship. Dash et al. (2019) examine the causality and co-

movement between stock market liquidity and economic policy uncertainty for G7 countries and confirm the causality between the two. They further find evidence of a stronger relationship between illiquidity and economic policy uncertainty during a crisis. Interestingly, Dash et al. (2019) find illiquidity as a driver of economic policy uncertainty.

Debata and Mahakud (2018) find a moderate impact of economic policy uncertainty during normal conditions in an emerging order-driven stock market. However, during a financial crisis, the impact becomes significant. Zhang et al. (2021) provide evidence of a negative impact of economic policy uncertainty on the stock liquidity of Chinese firms. They further show that the impact is more significant for firms with an opaque information environment, weak risk resistance, and less investor attention. They suggest investor sentiment and quality of information disclosure as the transmission channels.

Lee (2011) uses an international sample to show that liquidity risk is a priced risk factor, and pricing varies across countries according to their political, economic, and geographical environment. Ma et al. (2019), using an international sample of 57 countries, show that an increased level of investors' risk perception reduces market liquidity. Additionally, their results are more pronounced for the countries with higher GDP per capita, more integrated markets, and more individualistic cultures.

Overall, the literature suggests a decrease in stock market liquidity with an increase in economic policy uncertainty. The majority of the literature focuses on the U.S. market except for a few like Debata and Mahakud (2018) that focus on the Indian market; Zhang et al. (2021) that focuses on the Chinese market besides Ma et al. (2019), and Dash et al. (2019) that offer multi-country evidence similar to my study. My study is different from these two studies as I use stock liquidity, unlike these studies that investigate the market liquidity. Additionally, Ma et al. (2019)

examine the impact of investors' risk perception that might be affected by various factors other than economic policy uncertainty. I fill the gap in the literature by providing multi-country evidence of the EPU-liquidity relationship at the firm level and analyzing the role of firms' informational environment in shaping the EPU-liquidity relationship.

Based on the theoretical models and the empirical estimates from the concerned literature, I predict that economic policy uncertainty reduces stock liquidity. I postulate the first hypothesis as:

$H_0$1: Economic policy uncertainty does not affect stock liquidity globally.

H_a1: Increased level of economic policy uncertainty reduces stock liquidity globally.

I further analyze different firm attributes that explain the uncertainty-liquidity relationship. I focus on two categories of attributes about a firm's information environment, i.e., informational transparency and quality of information as the determinants of liquidity-uncertainty relationship.

The theoretical literature on price formation suggests that market makers set market-clearing prices conditioned on aggregate trade by informed and noise traders. They decrease market liquidity (increase bid-ask spread) to compensate themselves against the adverse selection risk of informed traders (Bagehot, 1971; Kyle, 1985). In the Ho and Stoll (1981) model, bid and ask prices are determined to maximize market makers' expected utility of terminal wealth. While supplying liquidity to the market, the dealer is exposed to two types of risk, i.e., the risk associated with the return on the dealer's inventory and the risk associated with the transaction time. They show that the bid-ask spread is determined by profit-maximizing risk-neutral spread and the risk premium. As the uncertainty increases, the adverse selection risk increases and results in a wider bid-ask spread. Copeland & Galai (1983) and Glosten & Milgrom (1985) argue that dealers widen

the bid-ask spread when faced with information asymmetry to compensate for any expected loss caused due to trade with informed traders.

At the time of heightened policy uncertainty, when the market makers and investors are skeptical about economic outcomes and an increased level of informed trading, they are reluctant to supply liquidity. For the stocks of informationally efficient firms, traders increase their willingness to accommodate supply shocks, given a reduction in their trading losses (Mendelson and Tunca, 2004; Madhavan, 1992). Therefore, investors and traders reward the firms with a high level of informational transparency with a relatively lower spread and more liquidity. Consequently, I predict that the negative impact of policy uncertainty on liquidity is less severe for informationally transparent firms. Following the prior literature, I use four different proxies for informational transparency. These proxies include the number of analysts following a firm, overall institutional ownership in a firm, foreign institutional ownership in a firm, and a firm's corporate governance.

Analysts provide public information to financial markets and reduce firm-specific information asymmetry (Roulstone, 2003) and help improve market liquidity. Following Roulstone (2003) and Zhang (2006), I use analyst following as measured by the number of analysts following a firm as a proxy for the amount of information publicly available for a firm.

As institutional investors are informed investors, the presence of multiple institutional investors increases competition and thereby increases the rate of information incorporation in the stock price. It leads to a lower level of uncertainty about the stock's actual value (Subrahmanyam, 1991; Holden and Subrahmanyam, 1992; Spiegel and Subrahmanyam, 1992, Wang, 1993; Easley and O'Hara, 2004). Baker and Stein (2004) argue that institutional investors are rational investors who trade based on fundamentals and not likely to be affected by the sentiments. A higher

proportion of institutional owners in the ownership structure, therefore, reduces the liquidity risk. I use the proportion of institutional ownership as the second proxy for informational transparency.

Participation by large international financial institutions improves the firm's information disclosure (Stulz, 1999 a, b). Foreign institutional investors are perceived as more experienced and better informed (Grinblatt and Keloharju, 2000; Seasholes, 2004; Rhee and Wang, 2009) and better monitors of corporate actions (Khanna and Palepu, 1999). A firm with a high level of foreign institutional ownership has relatively less information asymmetry. Therefore, I use foreign institutional ownership as a proportion of a firm's total market capitalization as the third proxy for informational transparency.

Firm-level corporate governance has been well recognized in the literature for its role in reducing information asymmetry. Transparency and information disclosure are major corporate governance elements that reduce information asymmetry (Chung et al., 2010; Prommin et al., 2014; Tang and Wang, 2011). Better governance practices reduce the risk of adverse selection (Charoenwong et al., 2011). This, in turn, motivates the market makers and investors to provide more liquidity to the firms with better governance. Amid the uncertainty, when the traders are reluctant to trade due to the heightened risk of potential loss, they feel more confident about better-governed firms because of the informational transparency that such firms offer. I, therefore, use the quality of corporate governance as my fourth proxy for informational transparency. I create the 'Corporate Governance Index' to measure the quality of governance practices.

I propose the following testable hypothesis for informational transparency:

> *$H_0$2a: Firm-level informational transparency does not affect the economic policy uncertainty - liquidity relationship.*

H_a2a: Firm-level informational transparency helps combat the negative impact of economic policy uncertainty on stock liquidity.

A firm with more publicly available information reduces the risk of adverse selection. Nevertheless, one cannot ignore the quality of that information. Both information asymmetry and the quality of information about the firm value determine market liquidity (Lee and Yahn, 1997; Easley and O'Hara, 1992; Coller and Yohn, 1997). Following prior literature (Brown et al. 1987; and Barron et al. 1998), I use analyst forecast dispersion and analyst forecast revision as the proxies for information quality. Higher analyst forecast dispersion and analyst forecast revisions reflect poor quality of information and predict a lower liquidity level. Market makers, while supplying liquidity, give importance to the quality of information. I predict that a firm with a higher quality of information, as reflected by lower levels of analyst forecast dispersion and analyst forecast revision, helps win the trust of the market makers and combats the negative impact of policy uncertainty on stock liquidity. I propose the testable hypotheses as:

$H_0$2b: Quality of information does not affect the economic policy uncertainty - liquidity relationship.

H_a2b: Better quality of information about the firm helps weaken the negative impact of economic policy uncertainty on stock liquidity.

Apart from the role of economic policy uncertainty in determining stock liquidity, I also analyze the country-wise relationship. I analyze the impact of economic policy uncertainty on stock liquidity both globally and at the individual country level.

2.3 Data and Methodology

2.3.1 Sample Construction

The study sample consists of 24 countries covering a sample period of 23 years from January 1997 to December 2019.[2] I classify the countries as '*Developed*' or '*Emerging*' using the MSCI market classification. According to this classification, 14 out of 24 countries are developed. These countries include Australia, Belgium, Canada, France, Germany, Ireland, Italy, Japan, Netherlands, Singapore, Spain, Sweden, United Kingdom (U.K.), and the United States (U.S.) Rest 10 are emerging countries, including Brazil, Chile, Colombia, Croatia, Greece, India, Korea, Mexico, Pakistan, and Russia. To calculate liquidity measures, I collect daily data for all countries except for the U.S., from Thompson Reuters Datastream. I collect U.S. data from the Centre for Research in Security Prices (CRSP). I obtain all the variables in U.S. dollars. I collect the data for only one major stock exchange in each country except for South Korea (Korea Stock Exchange and KOSDAQ) and the U.S. (NYSE and Nasdaq). Following the prior literature (Karolyi et al., 2012; Ma et al., 2019), I choose the stock exchange that trades most securities in that country. I retain all the dead stocks in the sample to avoid survivorship bias.

I calculate daily returns using the total return index (R.I.) of each stock. The RI variable in Datastream controls for dividends and stock splits and is reported to the nearest hundredth. Following Karolyi et al. (2012), I delete the observation in top and bottom 0.1% of the cross-sectional distribution of returns within each country. I consider the days when 90% or more of the stocks in a country have a return of zero as non-trading days and exclude them. I also exclude a stock as an illiquid stock if it has zero returns for more than 80% of the days in a given month.

[2] EPU index is available for 26 countries and the data for EPU index is available from 1997. I exclude China and Hong Kong due to data issues.

Due to the concerns of data errors, I apply some additional return filters. Following Griffin et al. (2010), I set the returns >200% as missing. I also set the returns (both $r_{i,d}$ and $r_{i,d-1}$) as missing if $(1+r_{i,d}) * (1+r_{i,d-1})-1$ is less than 20% and $r_{i,d}$ or $r_{i,d-1}$ is greater than 100%, where $r_{i,d}$ is the return on stock i on day d.

I collect all the fundamental information for international firms, except for the U.S. and Canadian firms, from Compustat Global. I collect the data for the U.S. and Canadian firms from Compustat North America. I obtain analyst earnings forecast data from Institutional Brokers' Estimate System (IBES) Summary History unadjusted. I use this source to obtain the number of analysts following a firm and compute analyst forecast dispersion as the standard deviation of analysts' earnings per share forecasts scaled by the consensus forecast's absolute value. I calculate forecast revision as the difference between the current month's consensus forecast and the previous month's consensus forecast scaled by the previous month's consensus forecast's absolute value. I get the data for institutional ownership for both domestic and foreign firms from FactSet.

I get the data from World Development Indicators (WDI) of the World Bank for country-level variables. I use the Fama-French 48 industry classification to differentiate industries. I winsorize my liquidity and other main control variables at 1% and 99% to deal with the outliers.

2.3.2 The measure of Economic Policy Uncertainty

I now discuss the measure of economic policy uncertainty. In the following sections, I discuss measures of other variables. Appendix Table 2A provides a brief description of all the variables.

I measure economic policy uncertainty using the monthly news-based economic policy uncertainty index developed by Baker et al. (2016) (EPU index). The index captures uncertainties about '*Who*,' '*What*' and '*When*' of economic policy decisions and their effects along with any non-

economic policy matters expected to have economic effects. The index is based on the volume of news articles related to economic policy uncertainty in leading newspapers. The newspaper-based frequency is the count of articles containing a combination of keywords covering three different areas, *viz*. uncertainty, policy, and economy. The keywords along with their variations include "uncertainty" or "uncertain"; "deficit"; "congress"; "Federal Reserve"; "legislation"; "regulation"; "White House"; "economy" or "economic" from the leading newspapers of the respective country. The set of policy-related terms differ across countries (e.g., using "RBI," "Reserve Bank," "Prime Minister's Office," "PM Office," "Lok Sabha," "excise duties," and "customs duties" for India, and using "Bank of Japan," "BOJ" for Japan). The raw counts are scaled by the total number of articles in that newspaper in a month to control for volume variations across newspapers and time. These numbers are then standardized to unit standard deviation over time and averaged across the newspapers in that country every month.

One of the concerns in using the EPU index as a measure of economic policy uncertainty arises from the methodology used to create the index. Since the index captures uncertainty based on the news articles containing a trio of the terms referring to economy, policy, and uncertainty, it might capture macroeconomic uncertainty rather than economic policy uncertainty. To deal with this issue, I control for the additional macroeconomic variables in the analysis following Duong et al. (2020) and Bloom (2009).

2.3.3 Stock Liquidity Measure

The liquidity literature offers different liquidity measures using high- and low-frequency data. For international studies, considering the large sample size, the longer time duration, and the relatively low data availability, low-frequency liquidity measures are preferred. For the baseline results, I use five different measures of liquidity, which are percent quoted spread (*P.Q. Spread*);

closing high and low measure (*CHL Spread*) of Abdi and Ronaldo (2017); high low spread measure (*High-Low Spread*) of Corwin and Schultz (2012); Amihud's illiquidity measure (*Ami_Illiquidity*); and the modified version of Amihud's illiquidity measure (*Modified LIQ*) as used in Karoyli et al. (2012). Following prior literature (Acharya and Pedersen, 2005; Avramov et al., 2006; Mahanti et al., 2008; Dick-Nielsen et al., 2012; Karolyi et al., 2012; Amihud et al., 2015 among others), I use Amihud's illiquidity measure throughout the analysis to capture the price impact. Using low-frequency data, Amihud's illiquidity measure is the best liquidity proxy for global research (Fong et al., 2017). It measures the daily price response per dollar of the trading volume. The illiquidity measure is calculated as the monthly average of the ratio of daily absolute stock returns to the dollar trading volume for that day.

$$Ami\_Illiquidity_{i,d} = 1/\mathrm{N}_{i,d} \left(\sum_{\mathrm{N}i,}^{d} \frac{|R_{i,d}|}{P_{i,d} * V_{i,d}}\right)$$

Where $R_{i,d}$ is the dollar return by of stock *i* on day *d*. $P_{i,d}$ is the dollar price of stock *i* on day *d*, and $V_{i,d}$ is the trading volume of stock *i* on day *d*.

To reduce the impact of outliers, following Karolyi e al. (2012), I modify Amihud's illiquidity measure and multiply the measure by -1 to make the interpretation simpler. The modified version of Amihud's illiquidity measure ($Modified\ LIQ_{i,d}$) is

$$Modified\ LIQ_{i,d} = -\log\left(1+\frac{|\mathrm{R}_{i,d}|}{P_{i,d} * V_{i,d}}\right)$$

Where $Modified\ LIQ_{i,d}$ is a modified version of Amihud's liquidity measure. $R_{i,d}$ is the dollar return of stock *i* on day *d*. $P_{i,d}$ is the dollar price of stock *i* on day *d*, and $V_{i,d}$ trading volume of stock *i* on day *d*.

Abidi and Ranaldo (2017) offer a new measure of liquidity based on closing, high and low prices. The rationality of the measure lies in the fact that transaction costs depart the security price from its efficient value. It is an improved version of Roll (1984) as it uses a richer information set and independent of order-flow dynamics. This method provides better estimates than Corwin and Schultz (2012) and Roll (1984) and other liquidity measures. Since it is less sensitive to the number of trades per day, it provides more accurate estimates for thinly traded securities. The spread measure of Abdi and Ronaldo (2017) is:

$$CHL\ Spread_t = 2\sqrt{E[(c_t - \eta_t)(c_t - \eta_{t+1})}$$

Where c_t is the log of the daily closing price for day *t*; η_t is the average of daily high and low log prices for day *t* and η_{t+1} is the average of daily high and low log prices for day *t+1*.

I also use the high-low spread estimator of Corwin and Schultz (2012). This measure performs better than the other liquidity proxies as a high-low percent-cost proxy (Fong et al., 2017). I calculate this measure as

$$High\text{-}Low\ Spread = \frac{2(e^{\alpha}-1)}{1+e^{\alpha}}$$

$$\text{where } \alpha = \frac{\sqrt{2\beta}-\sqrt{\beta}}{3-2\sqrt{2}} - \sqrt{\frac{\gamma}{3-2\sqrt{2}}};\ \beta = \sum_{j=0}^{1}\left[\ln\left(\frac{H^0_{t+j}}{L^0_{t+j}}\right)\right]^2 \text{ and } \gamma = \left[\ln\left(\frac{H^0_{t,t+1}}{L^0_{t,t+1}}\right)\right]^2$$

$H^0_{t,t+1}$ and $L^0_{t,t+1}$ are the observed high and low prices from time t to t+1, respectively.

Finally, I also use the percent quoted spread, the most commonly used measure of liquidity. I calculate the percent quoted spread as:

$$PQ\ Spread_{i,d} = \text{Ask Price}_{i,d} - \text{Bid Price}_{i,d} / ((\text{Ask Price}_{i,d} + \text{Bid Price}_{i,d})/2) * 100.$$

The subscript *i* and *d* here refer to the stock *i* on day *d*. This measure is calculated following Chung and Zhang (2014). Fong et al. (2017) analyze low-frequency proxies and find that overall, the percent quoted spread is the best percent-cost liquidity proxy.

For the above measure, I first calculate the daily liquidity and then average it over the month to calculate the monthly liquidity at the security level.

2.3.4 Other Variables

Analyst forecast Dispersion

Following Irvine and Liu (2020), I measure analyst forecast dispersion as the standard deviation of analyst earnings per share forecast for month *t* divided by the absolute value of mean earnings forecast (consensus forecast) for month *t*.

$$Analysts' Forecast\ Dispersion(t) = \frac{Standard\ Deviation(t)}{Abs(Consensus\ Forecast(t))}$$

Analyst forecast Revision

I calculate forecast revision as the difference between mean earnings forecast for month *t* and *t-1*, scaled by the absolute value of mean earnings forecast for the month *t-1*.

$$Forecast\ Revision(t) = \frac{Consensus\ forecast\ (t) - Consensus\ forecast\ (t-1)}{Abs(Consensus\ forecast\ (t-1))}$$

Corporate Governance Index

I calculate the firm-level corporate governance measure following Aggarwal et al. (2008). I obtain the data for twenty-three attributes of corporate governance from Datastream. I assign a value of 1 to a governance attribute if the firm meets the threshold level and zero otherwise. I then calculate the index's value as a percentage of the score out of the total number of attributes with non-missing data. If an attribute is missing, I eliminate it and calculate the percentage using the rest of the attributes. To calculate the index, I drop the observations with less than sixteen attributes with non-missing data. Appendix Table 2B reports all the twenty-three variables I use to develop the corporate governance index.

2.3.5 Controls

I use firm size, average monthly stock price, and stock return volatility as firm-level standard controls in each equation, analyzing the impact of policy uncertainty on stock liquidity. Large firm size increases the probability of finding a counterparty to take the opposite side of the

trade. It reduces the risk of holding inventory of such stocks (Stoll, 2000). Stock return volatility reflects the risk of adverse price change. A market maker is always concerned about the adverse price change in the inventory he/she is holding. Stoll (1978) and Holl and Stoll (1981) argue that market makers face diversification restrictions concerning unwanted inventory; therefore, variance rather than the systematic risk is relevant. Accordingly, I use total stock return volatility rather than systematic risk. Stoll (2000) argues that the average stock price controls for the effect of discreteness.

I also control for the gross domestic product (GDP) per capita, market volatility, and value-weighted market return as standard macro-level controls. GDP per capita controls for the country's level of development, and market volatility controls for the market's systematic risk.

2.4 Empirical Results

2.4.1 Descriptive Statistics

Table 2.1 provides the average values of the selected country-level measures for each of the 24 countries in the sample. Columns (3) and (4) report the beginning and ending date of date for each country. For most countries, the sample period starts from 1997-01 except for Belgium, Singapore, Croatia, and Pakistan, for which the EPU index is available beginning in 2001-01, 2003-01, 2003-01, and 2010-08, respectively. The EPU index for Mexico is available only up to 2019-09. Columns (5) and (6) show the number of unique stocks and the number of stock-month observations for each country. Columns (7) and (8) report average market return and market return volatility. Column (9) reports the average value of the EPU index. The average value of EPU score in the U.K. is the highest. It peaked with a value of 1141.8 in July 2016. The highest value in the U.K. reflects all uncertainties around significant events related to Brexit. Column (10) reports the GDP per capita in US$. The averages are across the sample period.

Table 2.2 reports the average values of the firm-specific variables in each country across the sample period. The proportion of institutional ownership is low in emerging countries as compared to the developed countries. The U.S. has the highest level of institutional ownership, given the fact that it is the most developed financial market in the world. But the level of foreign institutional ownership is low as the domestic institutional ownership base is significant for the U.S., and few foreign institutions invest in the United States compared to the domestic institutional investors. I do not have data for Croatia and Pakistan for institutional ownership and no data for Croatia's corporate governance attributes. The U.S. firms have the highest level of corporate governance, followed by India and Canada. Amihud's illiquidity score is the highest in India. It might be because India has a large number of listed stocks, but most of these stocks are not actively traded. The size column shows the average values of the natural log of total assets across the sample period. Stock return volatility is highest in Australia during my sample period, followed by India. United States (U.S.) has the highest trading volume with a very low score on Amihud's illiquidity measure, which is expected for the U.S. being the most developed and highly liquid financial market in the world.

Table 2.3 reports the correlations of various firm-specific and macro-level variables used in the analysis. The results show that firm size is highly negatively correlated to illiquidity. All the four proxies of informational transparency (*Institutional Ownership, Foreign Inst. Ownership, Analyst Following, and Corporate Governance)* are negatively related to illiquidity, which is consistent with conventional wisdom and prior literature. The coefficient of correlation between institutional ownership and corporate governance is 0.624. It does not interfere with the results as I do not use these two proxies for informational transparency in the same regression.

2.4.2 Impact of Economic Policy Uncertainty on Firm-level Liquidity

This section of the study purports to investigate the cross-sectional variations in the impact of economic policy uncertainty on stock liquidity at the firm level. I also examine how firm-level informational transparency and quality of information influence the economic policy uncertainty-liquidity relationship. I use unbalanced panel data for firm-level monthly liquidity and economic policy uncertainty. I use the following baseline model to capture the impact of economic policy uncertainty on stock liquidity globally.

$$LIQ_{j,i,t} = \alpha + \beta\, Home\_EPU_{i,t} + \lambda\, Firm\_Controls_{j,i,t} + \gamma\, Macro\_Controls_{i,t} + \epsilon_{i,t}$$

$LIQ_{j,\,i,t}$ is stock illiquidity (liquidity) using five different measures of illiquidity (liquidity)[3] for stock *j*, country *i* in month *t*. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. $Firm\_Controls_{j,i,t}$ represent firm-level control variables that include *Size* calculated as the natural log of total assets in year n-1 and *Average Monthly Price* calculated as the simple average of the daily closing price of stock *j* in month *t*. $Macro\_Controls_{i,t}$ represent various explanatory variables at the country level: GDP per Capita, Market Volatility, and *Market Return*.[4]

I test my first hypothesis using a baseline model. Table 2.4 Panel A reports the estimates of regression using five measures of stock illiquidity (liquidity) for the cross-country sample. Model (1), (2), (3), and (4) use *Ami_illiquidity*, *PQ Spread*, *CHL Spread*, *High-Low Spread* as measures of illiquidity, respectively. A higher value on these measures reflects lower liquidity. I find positive and highly significant coefficients indicating a statistically and economically

[3] I present the baseline results in Table 4A using all the five measures of illiquidity (liquidity). All other results are reported using Amihud's illiquidity measure although I find similar (unreported) results.

[4] Appendix Table 2A provides the description and calculation of all the variables.

significant negative impact of economic policy uncertainty on stock market liquidity. In Model (5), I use *Modified LIQ* as the dependent variable. *Modified LIQ* measures liquidity as opposed to the other four models, which are the measures for illiquidity. A negative and highly significant coefficient confirms the results from Model (1) through (4).

In Table 2.4 Panel B, I run the regression using the same model but for subgroups of individual countries, taking *Ami_illiquidity* as dependent variables. Table 2.4 Panel B reports the (beta coefficient of *Home_EPU*) sensitivity of stock liquidity to economic policy uncertainty. My results are consistent with the prior literature (Chung and Chuwonganant, 2014; Duong et al., 2020; Ma et al., 2019; Rehse et al., 2019) and with the cross-country sample except for Croatia and Russia, where the coefficients are insignificant. It might be attributed to the fact that I have a small number of observations with valid data from these two countries, therefore limited within-country variation.

2.4.3 Role of Firms' Information Environment in Shaping the Relationship between Economic Policy Uncertainty and Stock Liquidity

In this subsection, I examine the role of a firm's information environment that may affect the economic policy uncertainty-liquidity relationship. I consider two aspects of a firm's information environment *viz.* informational transparency and quality of information. Based on the prior literature, I use four proxies for informational transparency, which are the proportion of institutional ownership (*Institutional Ownership*), the proportion of foreign institutional ownership (*Foreign Inst. Ownership*), number of analysts following a firm (*Analyst Following*), and firms' corporate governance practices (*Corporate Governance)*. I use analysts' forecast dispersion (*Analyst Forecast Dispersion*) and revision of analyst forecast (*Analyst Forecast Revision*) as the proxies for quality of information. The results are presented in Panel A and B of Table 2.5.

Table 2.5 Panel A reports the estimates using one proxy and its interaction term with economic policy uncertainty at a time. Individually all four proxies for informational transparency are negative and significant, suggesting that firm-level informational transparency helps to improve liquidity. When I include the interaction terms of each of the proxies for informational transparency in the model (2), (4), (6), and (8) respectively, the coefficients on interaction terms for three out of four models are negative and highly significant. The results suggest that firm-level informational transparency helps combat the negative impact of economic policy uncertainty on stock liquidity. I observe that the coefficient on *Home_EPU* remains positive and consistent throughout. It suggests that although managers of the firms can reduce the negative impact of economic policy uncertainty by making the firms more transparent yet firm-level informational transparency cannot substitute policy-related information asymmetry. In models (9) through (12), I use one of the proxies for quality of information and their interaction with *Home_EPU* and find that a higher level of dispersion in analysts' forecasts reduces stock liquidity during uncertain times. However, analysts' forecast revision does not explain the variation in the economic policy uncertainty-liquidity relationship.

In Table 2.5 Panel B, I run the same regression but include at least one of the proxies for informational transparency and quality of information. In Model (15), I include all the proxies together except for institutional ownership[5] and find that all the three proxies for informational transparency help combat the negative impact of economic policy uncertainty on stock liquidity. In contrast, the quality of information does not matter.

[5] Institutional Ownership is highly correlated with Corporate Governance, including them together may cause multicollinearity.

2.4.4 Subsample Analysis

With the enhanced level of globalization, the firms operate in a more integrated environment. Investors nowadays are not restricted to the boundaries of his/her own country. With a high level of integration and international diversification, one would expect that the impact of economic policy uncertainty and the role of the information environment should be similar for stock liquidity across the globe. However, prior literature establishes that developed countries have lower information asymmetry than emerging countries (Claessens et al., 2006). A high level of information asymmetry in emerging countries may interfere with firm-level transparency measures and may not reflect similar results as for developed countries. I classify the countries as emerging or developed using MSCI index classification. Results from Table 2.6 Panel A and B and Table 2.7 Panel A and B show that the impact of economic policy uncertainty on stock liquidity is negative and significant for both groups of countries. However, the results on the role of firms' information environment indicate that the firm-level informational transparency helps to combat the negative effect of economic policy uncertainty on stock liquidity for developed countries. However, it does not help emerging countries. These results show the dominating role of country-level information asymmetry over a firm's information environment.

2.4.5 Robustness Check

I run multiple robustness checks on my findings to validate the results and confirm the negative and significant impact of economic policy uncertainty on stock liquidity. In the cross-country analysis, if economic policy uncertainty negatively affects stock liquidity, this impact should be even stronger for the firms in industries with greater exposure to economic policy uncertainty. Following Brogaard and Detzel (2015), Bonaime *et al.* (2018), and Duong *et al.* (2020), I obtain the industry sensitivity beta. I regress each of the value-weighted monthly stock returns for each industry based on the Fama-French 48 industry classification on Home_EPU and

the market return and estimate coefficient of Home_*EPU*. This beta coefficient measures the sensitivity of the industry's return to economic policy uncertainty. I then create a dummy variable *'Industry Sensitivity Dummy'* and assign it a value of 1 if the beta is above the median and zero otherwise. I interact this dummy variable with Home_EPU in the baseline regression. Model (1) of Table 2.8 reports the results using *Industry Sensitivity Dummy*. The interaction term has a positive and statistically significant coefficient. The results suggest that the impact of economic policy uncertainty is stronger for the industries with greater exposure to economic policy uncertainty. In model (2), I use the EPU-return sensitivity (beta coefficient) as a continuous variable and find similar results.

One of the potential concerns with using the EPU index as a measure of economic policy uncertainty is that it might capture the uncertainty arising from other macroeconomic forces. I use three additional controls at the macro level. The results reported in Table 2.8 Model (3) show that even after controlling for additional macro controls, a surge in economic policy uncertainty reduces stock liquidity in the cross-country analysis.

Another potential concern with my analysis is the confounding effect of the U.S. economic policy uncertainty. The U.S., being one of the strongest economies with a highly developed financial market, might drive or at least influence the economic policy uncertainty of other markets. To deal with this issue, I get a subsample excluding the U.S. and run the baseline regression controlling for U.S. economic policy uncertainty. Model (4) of Table 2.8 reports the estimates of this regression. Domestic country's economic policy uncertainty remains positive and significant, suggesting a decrease in stock liquidity with a surge in economic policy uncertainty even after controlling for the U.S. economic policy uncertainty. Additionally, the U.S. economic

policy uncertainty also negatively affects stock liquidity. The results suggest a spillover effect of the U.S. economic policy uncertainty on other markets' stock liquidity.

2.5 Conclusions

Liquidity is the backbone of any financial system. It ensures the efficient utilization of assets through mobility from one entity to the other. In this essay, I provide cross-country evidence on the detrimental impact of economic policy uncertainty on liquidity. Using a large dataset from 24 developed and emerging countries from 1996 through 2019, I report a significant negative impact of economic policy uncertainty on stock liquidity. The results hold for most countries in the sample and with various firm and macro controls.

I further examine the cross-sectional variations in the impact of economic policy uncertainty on stock liquidity. I show that firm-level informational transparency helps mitigate the negative effect of economic policy uncertainty on stock liquidity. However, the quality of information remains insignificant. These results are consistent across countries. My study documents economic policy uncertainty as an essential determinant of stock liquidity globally. Overall, my study contributes to the literature on the determinants of stock liquidity internationally

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TABLES

Table 2.1: Summary Statistics for Country-Level Variables

This panel reports the summary statistics of country-level variables for 24 countries from 1997-01 to 2019-12. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically. The first six columns present Country, ISO, the first month in the sample, the last month in the sample, the number of unique stocks, and stock-month observations in the sample for each country, respectively. The following four columns contain the time-series averages (over the period from the first month in the sample to 2019-12) of *Market Return*, *Market Volatility*, *Home_EPU*, and *GDP per Capita* in US$. Appendix Table 2A provides the definitions of all variables.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Country	**ISO**	**Start Date**	**End Date**	**Number of unique stocks**	**Stock-month observations**	***Market Return***	***Market Volatility***	***Home_EPU***	***GDP Per Capita ($)***
Developed									
Australia	AUS	1997-01	2019-12	3,151	304,096	1.307	1.032	99.855	42,330.440
Belgium	BEL	2001-01	2019-12	348	32,856	1.018	0.930	99.961	38,420.930
Canada	CAN	1997-01	2019-12	3,237	283,796	1.338	0.828	149.882	38,512.940
France	FRA	1997-01	2019-12	1,708	159,713	1.113	0.889	163.793	35,437.850
Germany	DEU	1997-01	2019-12	1,451	130,588	1.153	0.993	131.214	37,984.770
Ireland	IRL	1997-01	2019-12	97	9,671	1.620	1.182	113.446	49,946.490
Italy	ITA	1997-01	2019-12	793	80,883	0.994	0.933	109.301	30,875.060
Japan	JPN	1997-01	2019-12	4,000	721,842	0.765	1.088	109.921	38,228.520
Netherlands	NLD	1997-01	2019-12	307	36,798	0.968	0.926	95.972	43,641.780
Singapore	SGP	2003-01	2019-12	858	109,563	1.308	0.868	128.404	41,306.100
Spain	ESP	1997-01	2019-12	319	35,030	1.047	1.087	101.960	25,919.960
Sweden	SWE	1997-01	2019-12	1,288	111,035	1.293	1.167	92.864	46,532.160
UK	GBR	1997-01	2019-12	4,072	338,568	0.688	0.694	189.080	38,901.140
USA	USA	1997-01	2019-12	20,712	1,594,689	0.773	1.036	118.025	46,505.850
Emerging									
Brazil	BRA	1997-01	2019-12	654	52,878	1.952	1.643	140.800	7,625.620
Chile	CHL	1997-01	2019-12	229	20,277	1.021	0.896	110.098	10,273.790
Colombia	COL	1997-01	2019-12	74	5,441	1.213	1.020	103.499	4,895.460
Croatia	HRV	2003-01	2019-12	167	8,400	1.796	1.179	101.773	11,047.980
Greece	GRC	1997-01	2019-12	447	60,857	1.274	1.302	98.894	20,462.370
India	IND	1997-01	2019-12	3,428	278,663	1.753	1.003	94.657	1,094.450
Korea	KOR	1997-01	2019-12	3,317	435,615	2.255	1.530	126.988	21,361.780
Mexico	MEX	1997-01	2019-09	287	21,952	1.140	1.003	95.178	8,594.110
Pakistan	PAK	2010-08	2019-12	557	66,556	2.046	1.153	94.080	937.470
Russia	RUS	1997-01	2019-12	79	1,026	3.427	2.103	100.857	7,969.710

Table 2.2: Summary Statistics for Firm-Level Variables

This table reports average values of stock illiquidity using Amihud's measure of illiquidity (***Ami_illiquidity***); proxies for firm-level informational transparency: *Institutional Ownership, Foreign Inst. Ownership, Analyst Following, Corporate Governance*; proxies for the quality of information: *Analyst Forecast Dispersion, Analyst Forecast Revision* and firm-level control variables: *Size, Average Monthly Price, Return Volatility, Stock Return*, and *Trading Volume*. These are the time-series averages (over the period from the first month in the sample to 2019:12) for 24 countries in the sample. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically. Appendix Table 2A provides the definitions of all variables.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Country	**ISO**	***Ami_illiquidity***	***Institutional Ownership***	***Foreign Inst. Ownership***	***Analust Following***	***Corporate Governance***	***Analyst Forecast Dispersion***	***Analyst Forecast Revision***	***Size***	***Average Monthly Price***	***Return Volatility***	***Stock Return***	***Trading Volume***
Developed													
Australia	AUS	18.243	0.065	0.048	3.711	65.740	0.551	6.256	3.373	11.054	4.536	0.815	1478.060
Belgium	BEL	324.771	0.101	0.069	3.772	57.020	0.431	1.107	6.263	161.147	3.330	1.195	113.466
Canada	CAN	9.539	0.242	0.096	4.385	73.543	0.541	5.568	5.580	19.855	3.647	0.735	495.501
France	FRA	4.762	0.107	0.061	4.677	57.024	0.462	1.487	5.575	43.460	2.662	0.567	405.793
Germany	DEU	82.441	0.123	0.079	5.953	46.295	0.490	1.874	5.776	35.105	3.732	0.214	140.237
Ireland	IRL	10.487	0.235	0.226	2.735	64.770	0.207	4.102	5.655	75.311	3.081	0.787	1453.820
Italy	ITA	1.184	0.079	0.060	4.536	51.340	0.442	7.606	6.337	188.984	2.249	0.260	4217.360
Japan	JPN	0.687	0.065	0.037	2.632	34.585	0.371	6.378	6.369	48.695	2.499	0.586	915.949
Netherlands	NLD	3.134	0.217	0.163	5.690	60.361	0.504	1.085	6.379	41.231	2.360	0.464	1999.400
Singapore	SGP	28.717	0.049	0.041	4.098	59.719	0.335	10.881	5.541	1.527	3.166	0.983	4366.830
Spain	ESP	0.707	0.105	0.070	5.331	53.791	0.508	5.765	6.890	17.215	2.162	0.444	4807.370
Sweden	SWE	11.914	0.190	0.061	4.326	41.848	0.522	0.515	4.450	12.790	3.379	0.291	982.989
UK	GBR	3.014	0.232	0.056	3.617	60.619	0.344	0.617	4.903	8.994	2.581	0.012	2891.770
USA	USA	1.804	0.517	0.050	4.681	76.244	0.319	3.891	6.198	31.929	3.045	0.582	224992.870

Table 2.2: Summary Statistics for Firm-Level Variables (Cont.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Country	**ISO**	***Ami_illiquidity***	***Institutional Ownership***	***Foreign Inst. Ownership***	***Analyst Following***	***Corporate Governance***	***Analyst Forecast Dispersion***	***Analyst Forecast Revision***	***Size***	***Average Monthly Price***	***Return Volatility***	***Stock Return***	***Trading Volume***
Emerging													
Brazil	BRA	4.107	0.162	0.130	3.469	50.495	0.577	17.204	7.580	27.319	3.054	1.109	16559.540
Chile	CHL	3.020	0.049	0.038	2.223	37.664	0.649	3.156	6.811	3.083	1.771	1.319	8468.250
Colombia	COL	0.539	0.026	0.025	1.779	51.028	0.251	2.473	7.542	4.817	1.940	1.788	11482.390
Croatia	HRV	11.599	.	.	1.384	.	0.188	0.295	5.427	98.826	3.191	1.849	6.027
Greece	GRC	37.272	0.037	0.034	2.721	44.643	0.329	4.493	5.210	372.323	3.445	1.129	179.408
India	IND	622.266	0.045	0.024	3.349	73.846	0.285	0.167	2.405	1.202	4.390	2.876	86.977
Korea	KOR	1.377	0.045	0.043	3.821	51.145	0.636	24.430	5.610	43.800	3.641	0.971	1027.190
Mexico	MEX	12.641	0.121	0.101	3.765	45.696	0.473	2.649	7.493	184.190	2.178	0.927	3616.660
Pakistan	PAK	168.304	.	.	1.937	48.550	0.280	0.319	4.151	0.865	3.363	2.715	1002.940
Russia	RUS	134.880	0.065	0.064	2.048	34.644	0.507	11.520	8.115	24.715	3.477	5.022	1024.100

Table 2.3: Correlation Matrix

This table provides Pearson's correlation coefficients among the main firm-level and country-level variables used in my main regression analysis. Appendix Table 2A provides the definitions of all variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Variables	***Home_EPU***	***Ami_Illiquidity***	***Institutional Ownership***	***Foreign Inst. Ownership***	***Analyst Following***	***Corporate Governance***	***Analyst Forecast Revision***	***Analyst Forecast Dispersion***	***Size***	***GDP Per Capita***	***Average Monthly Price***	***Market Volatility***	***Market Return***
Home_EPU	1.000												
Ami_Illiquidity	0.167	1.000											
Institutional Ownership	0.003	-0.269	1.000										
Foreign Inst. Ownership	0.022	-0.159	0.080	1.000									
Analyst Following	-0.019	-0.351	0.083	0.089	1.000								
Corporate Governance	0.212	-0.159	0.624	0.032	0.057	1.000							
Analyst Forecast Revision	0.000	-0.007	0.002	0.000	0.002	0.003	1.000						
Analyst Forecast Dispersion	0.001	0.002	0.005	-0.002	0.002	-0.001	0.000	1.000					
Size	-0.075	-0.606	-0.108	0.085	0.267	-0.067	0.003	-0.002	1.000				
GDP Per Capita	0.071	-0.209	0.478	-0.034	0.009	0.472	0.000	-0.001	-0.042	1.000			
Average Monthly Price	-0.011	-0.016	-0.027	-0.009	-0.020	-0.012	0.000	0.000	0.047	-0.002	1.000		
Market Volatility	0.338	0.113	-0.049	-0.013	0.035	-0.060	0.000	0.001	0.058	-0.180	0.007	1.000	
Market Return	-0.114	-0.036	0.006	0.011	0.010	0.036	0.000	-0.003	-0.015	0.019	-0.001	-0.424	1.000

Table 2.4 Panel A: Impact of Economic Policy Uncertainty (EPU) on Firm-Level Liquidity

This table presents the empirical results for the first hypothesis using stock liquidity as the dependent variable. I estimate the following baseline model: $LIQ_{j,i,t} = \alpha + \beta Home\_EPU_{i,t} + \lambda Firm\_Controls_{j,i,t} + \gamma\ Macro\_Controls_{i,t} + \epsilon_{i,t}$, where $LIQ_{j,i,t}$ is stock illiquidity (liquidity) using five different measures of illiquidity (liquidity) for stock *j*, country *i* in month *t*. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. $Firm\_Controls_{j,i,t}$ represent firm-level control variables that include *Size* calculated as the natural log of total assets in year n-1 and *Average Monthly Price* calculated as the simple average of the daily closing price of stock *j* in month *t*. $Macro\_Controls_{i,t}$ represents various explanatory variables at the country level: *GDP per Capita*, *Market Volatility*, and *Market Return*. Appendix Table 2A provides definitions of variables and their calculation.

	(1)	(2)	(3)	(4)	(5)
Variables	***Ami_Illiquidity***	***PQ Spread***	***CHL Spread***	***High-Low Spread***	***Modified LIQ***
Home_EPU	0.444***	0.260***	0.073***	0.077***	-0.014***
	(40.047)	(47.640)	(22.739)	(19.254)	(-10.182)
Size	-1.001***	-0.367***	-0.156***	-0.139***	0.005***
	(-186.729)	(-169.972)	(-140.374)	(-115.795)	(14.905)
GDP Per Capita	0.669***	0.831***	0.188***	-0.028**	0.210***
	(14.788)	(42.030)	(17.123)	(-2.214)	(14.328)
Average Monthly Price	-0.000*	-0.000	-0.000	0.000	-0.000***
	(-1.874)	(-0.679)	(-1.464)	(0.327)	(-3.437)
Market Volatility	0.330***	0.174***	0.277***	0.207***	0.001**
	(68.779)	(80.519)	(201.599)	(145.601)	(1.995)
Market Return	-0.004***	-0.001***	0.001***	0.002***	0.000***
	(-17.823)	(-8.851)	(17.314)	(25.792)	(8.174)
Constant	-6.072***	-8.018***	-6.163***	-4.167***	-2.172***
	(-12.907)	(-38.590)	(-54.524)	(-31.662)	(-14.531)
Time F.E.	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes
Observations	3,666,781	3,387,554	2,926,607	2,925,708	3,666,781
R-Squared	0.651	0.662	0.389	0.333	0.077

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 2.4 Panel B: Impact of EPU on Firm-Level Liquidity by Country

This table reports the sensitivity (β) of stock liquidity to policy uncertainty for the developed and emerging countries in the sample. Using the baseline model from Table 4 Panel A, I report the beta coefficient of *Home_EPU*, the number of observations used in the regression, and the R-square from the panel regression by country. I use *Ami_illiquidity* as the dependent variable. Appendix Table 2A provides definitions of variables.

Country	**ISO**	***Home_EPU***	**# Observations**	**R-squared**
Developed				
Australia	AUS	0.245***	237,650	0.530
		(24.490)		
Belgium	BEL	0.261**	15,968	0.237
		(2.055)		
Canada	CAN	0.275***	205,800	0.538
		(21.631)		
France	FRA	0.135***	118,859	0.658
		(13.263)		
Germany	DEU	0.230***	91,044	0.571
		(22.599)		
Ireland	IRL	0.123***	7,373	0.572
		(3.575)		
Italy	ITA	0.209***	56,967	0.512
		(11.451)		
Japan	JPN	0.362***	554,099	0.596
		(59.206)		
Netherlands	NLD	0.303***	26,957	0.702
		(13.528)		
Singapore	SGP	1.074***	59,950	0.344
		(19.106)		
Spain	ESP	0.176***	25,102	0.690
		(5.062)		
Sweden	SWE	0.699***	84,561	0.574
		(19.810)		
UK	GBR	0.278***	246,364	0.641
		(26.832)		
USA	USA	0.245***	1,401,557	0.553
		(50.108)		

Table 2.4 Panel B: Impact of EPU on Firm-Level Liquidity by Country (Cont.)

Country	ISO	*Home_EPU*	# Observations	R-squared
Emerging				
Brazil	BRA	0.187***	38,728	0.239
		(9.397)		
Chile	CHL	0.279***	14,193	0.517
		(7.573)		
Colombia	COL	0.144**	3,184	0.608
		(2.567)		
Croatia	HRV	-0.024	5,557	0.485
		(-0.912)		
Greece	GRC	0.605***	35,042	0.601
		(16.801)		
India	IND	0.419***	188,392	0.296
		(32.886)		
Korea	KOR	0.303***	208,077	0.312
		(41.185)		
Mexico	MEX	0.178***	15,889	0.437
		(4.658)		
Pakistan	PAK	0.218***	24,942	0.456
		(7.036)		
Russia	RUS	0.041	526	0.775
		(0.521)		

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 2.5 Panel A: Impact of Information Transparency and Quality on EPU-Liquidity Relationship

This table reports the empirical results of panel regression for hypotheses 2a and 2b using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for informational transparency or quality of information and their interaction with *Home_EPU*. Firm-level controls and country controls are the same as those used in Table 2.4 Panel A and B. Models (1) and (2) use *Institutional Ownership* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (3) and (4) use *Foreign Inst. Ownership* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (5) and (6) use *Analyst Following* as a proxy of informational and its interaction with *Home_EPU*. Models (7) and (8) use *Corporate Governance* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (9) and (10) use *Analyst Forecast Dispersion* as a proxy for quality of information and its interaction with *Home_EPU*. Models (11) and (12) use *Analyst Forecast Revision* as a proxy for quality of information and its interaction with *Home_EPU*. Appendix Table 2A provides definitions of variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Home_EPU	0.383***	0.489***	0.395***	0.401***	0.386***	0.435***	0.233***	1.990***	0.209***	0.209***	0.264***	0.264***
	(32.390)	(33.214)	(33.644)	(29.282)	(27.760)	(25.231)	(9.185)	(7.878)	(23.625)	(23.605)	(28.652)	(28.651)
Institutional Ownership	-4.772***	-2.678***										
	(-88.140)	(-17.174)										
Home_EPU*Institutional Ownership		-0.443***										
		(-14.099)										
Foreign Inst. Ownership			-4.595***	-4.115***								
			(-29.414)	(-6.968)								
Home_EPU*Foreign Inst. Ownership				-0.101								
				(-0.871)								
Analyst Following					-0.773***	-0.539***						
					(-80.706)	(-10.520)						
Home_EPU*Analyst Following						-0.050***						
						(-4.676)						
Corporate Governance							-0.642***	1.352***				
							(-8.347)	(4.696)				
Home_EPU*Corporate Governance								-0.426***				
								(-6.948)				
Analyst Forecast Dispersion									0.000***	-0.000***		
									(3.749)	(-2.660)		

Table 2.5 Panel A: Impact of Information Transparency and Quality on EPU-Liquidity Relationship (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Home_EPU*Analyst Forecast Dispersion										0.000***		
										(2.945)		
Analyst Forecast Revision											-0.000	-0.000
											(-1.422)	(-0.188)
Home_EPU*Analyst Forecast Revision												0.000
												(0.131)
Size	*-0.818****	-0.818***	-0.988***	-0.988***	-0.740***	-0.739***	-0.719***	-0.718***	-0.890***	-0.890***	-0.963***	-0.963***
	(-120.189)	(-120.107)	(-146.169)	(-146.115)	(-113.192)	(-113.153)	(-56.698)	(-56.817)	(-127.205)	(-127.205)	(-142.365)	(-142.365)
GDP Per Capita	*0.551****	0.512***	0.759***	0.758***	0.838***	0.839***	1.115***	1.116***	0.852***	0.852***	1.191***	1.191***
	(9.764)	(9.075)	(13.243)	(13.220)	(11.503)	(11.521)	(9.968)	(10.013)	(3.701)	(3.701)	(8.496)	(8.496)
Average Monthly Price	*-0.000****	-0.000***	-0.000**	-0.000**	-0.000***	-0.000***	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-2.984)	(-2.973)	(-2.008)	(-2.008)	(-2.608)	(-2.613)	(-0.493)	(-0.482)	(-0.210)	(-0.210)	(-0.193)	(-0.193)
Market Volatility	*0.315****	0.330***	0.339***	0.339***	0.377***	0.378***	0.365***	0.372***	0.401***	0.401***	0.378***	0.378***
	(70.555)	(72.676)	(74.045)	(73.947)	(66.170)	(66.254)	(38.962)	(39.239)	(97.455)	(97.460)	(84.749)	(84.749)
Market Return	*-0.002****	-0.002***	-0.002***	-0.002***	0.002***	0.002***	-0.000	0.000	0.008***	0.008***	0.006***	0.006***
	(-10.480)	(-9.401)	(-9.569)	(-9.562)	(6.325)	(6.437)	(-0.749)	(0.161)	(31.993)	(31.997)	(24.957)	(24.958)
Constant	-4.745***	-4.842***	-7.135***	-7.157***	-9.817***	-10.068***	-11.297***	-19.515***	-9.746***	-9.746***	-12.763***	-12.763***
	(-7.878)	(-8.034)	(-11.644)	(-11.680)	(-12.805)	(-13.127)	(-8.965)	(-12.626)	(-3.950)	(-3.950)	(-8.518)	(-8.518)
Time F.E.	*Yes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	*Yes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	*2,216,206*	2,216,206	2,216,206	2,216,206	1,492,859	1,492,859	535,836	535,836	985,400	985,400	1,214,449	1,214,449
R-Squared	*0.675*	0.676	0.602	0.602	0.647	0.647	0.582	0.582	0.554	0.554	0.564	0.564

t-stat in parentheses

*** p<.0.01, **p<0.05, and *p<0.10

Table 2.5 Panel B: Impact of Information Transparency and Quality on EPU-Liquidity Relationship

This table reports the empirical results using panel regression for hypotheses 2a and 2b using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and a combination of proxies for informational transparency and quality of information and their interaction terms with *Home_EPU*. Firm-level controls and country controls are the same as used in Table 2.4 Panel A and B. Appendix Table 2A provides definitions of variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Home_EPU	0.533***	0.231***	0.116***	1.282***	0.580***	0.280***	0.108***	0.729***	0.526***	0.230***	0.114***	1.314***	1.095***	1.164***
	(17.856)	(20.192)	(7.471)	(4.055)	(23.470)	(23.508)	(6.987)	(2.791)	(17.488)	(20.035)	(7.331)	(4.111)	(4.571)	(5.201)
Institutional Ownership	-0.939***				-1.092***				-1.022***					
	(-4.346)				(-5.697)				(-4.710)					
Home_EPU* Institutional Ownership	-0.549***				-0.606***				-0.535***					
	(-12.227)				(-15.258)				(-11.869)					
Foreign Inst. Ownership		-0.817				-1.288**				-0.818			2.385***	1.944***
		(-1.589)				(-2.313)				(-1.586)			(3.604)	(3.184)
Home_EPU* Foreign Inst. Ownership		-0.286***				-0.278**				-0.284***			-0.788***	-0.645***
		(-2.704)				(-2.437)				(-2.684)			(-5.631)	(-5.012)
Analyst Following			-0.548***				-0.726***				-0.557***			0.267***
			(-12.053)				(-15.808)				(-12.216)			(5.205)
Home_EPU* Analyst Following			-0.014				0.004				-0.012			-0.118***
			(-1.505)				(0.382)				(-1.292)			(-10.617)
Corporate Governance				0.659**				0.019				0.694**	0.515**	0.515**
				(2.013)				(0.071)				(2.101)	(1.986)	(2.106)
Home_EPU* Corporate Governance				-0.270***				-0.135**				-0.278***	-0.207***	-0.181***
				(-3.694)				(-2.215)				(-3.751)	(-3.675)	(-3.423)
Analyst Forecast Dispersion	-0.000*	-0.000**	-0.000***	0.000					-0.000*	-0.000**	-0.000***	0.000	0.000	0.000
	(-1.746)	(-2.471)	(-2.914)	(0.219)					(-1.744)	(-2.477)	(-2.921)	(0.220)	(0.186)	(0.206)

Table 2.5 Panel B: Impact of Information Transparency and Quality on EPU-Liquidity Relationship (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Home_EPU* Analyst Forecast Dispersion	0.000**	0.000***	0.000***	-0.000					0.000**	0.000***	0.000***	-0.000	-0.000	-0.000
	(2.051)	(2.735)	(3.202)	(-0.191)					(2.046)	(2.739)	(3.209)	(-0.191)	(-0.188)	(-0.195)
Analyst Forecast Revision					0.000	-0.000	-0.000	-0.000	0.000	-0.000	-0.000	-0.000	0.000	-0.000
					(0.067)	(-0.268)	(-0.275)	(-0.492)	(0.046)	(-0.243)	(-0.247)	(-0.479)	(0.393)	(-0.707)
Home_EPU* Analyst Forecast Revision					-0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.000
					(-0.110)	(0.215)	(0.180)	(0.369)	(-0.086)	(0.195)	(0.157)	(0.361)	(-0.589)	(0.476)
Size	-0.760***	-0.891***	-0.738***	-0.637***	-0.782***	-0.958***	-0.747***	-0.646***	-0.763***	-0.893***	-0.740***	-0.637***	-0.582***	-0.521***
	(-87.902)	(-105.398)	(-108.632)	(-53.390)	(-92.797)	(-116.482)	(-113.768)	(-55.316)	(-87.812)	(-104.885)	(-108.137)	(-53.234)	(-43.712)	(-39.781)
GDP Per Capita	0.611***	0.746***	0.692***	1.838***	0.863***	1.019***	0.721***	1.909***	0.605***	0.734***	0.674**	1.818***	1.663***	1.503***
	(2.778)	(3.381)	(2.636)	(8.589)	(6.209)	(7.196)	(3.968)	(10.295)	(2.700)	(3.276)	(2.543)	(8.376)	(8.940)	(8.535)
Average Monthly Price	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	0.000***	0.000
	(-1.256)	(0.191)	(-0.697)	(1.388)	(-1.381)	(0.179)	(-0.737)	(1.434)	(-1.259)	(0.186)	(-0.701)	(1.399)	(2.868)	(1.068)
Market Volatility	0.382***	0.397***	0.457***	0.364***	0.360***	0.375***	0.449***	0.356***	0.381***	0.397***	0.458***	0.363***	0.361***	0.372***
	(92.199)	(88.002)	(99.266)	(58.152)	(78.870)	(75.864)	(91.365)	(56.784)	(91.724)	(87.579)	(99.558)	(58.882)	(58.483)	(57.493)
Market Return	0.008***	0.008***	0.011***	0.004***	0.006***	0.006***	0.010***	0.004***	0.008***	0.008***	0.011***	0.004***	0.005***	0.007***
	(31.476)	(29.587)	(32.186)	(10.695)	(21.259)	(20.910)	(27.664)	(10.190)	(31.338)	(29.660)	(32.479)	(10.867)	(13.447)	(14.681)
Constant	-7.514***	-8.679***	-8.206***	-25.940***	-9.914***	-10.965***	-8.172***	-23.910***	-7.366***	-8.536***	-7.999***	-25.883***	-24.212***	-23.491***
	(-3.168)	(-3.654)	(-2.917)	(-11.407)	(-6.688)	(-7.213)	(-4.211)	(-12.446)	(-3.053)	(-3.536)	(-2.815)	(-11.196)	(-11.348)	(-11.516)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	695,006	695,006	773,540	252,906	862,312	862,312	860,548	276,351	689,604	689,604	768,975	251,866	182,001	166,370
R-Squared	0.655	0.550	0.604	0.533	0.669	0.560	0.618	0.537	0.657	0.551	0.604	0.533	0.546	0.572

t-stat in parentheses

*** p<.0.01, **p<0.05, and *p<0.10

Table 2.6 Panel A: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Emerging Countries

This table presents the empirical results using panel regression for subsample analysis, including only emerging countries in the sample. Countries are classified as emerging using MSCI Index. Results of panel regression for hypotheses 2a and 2b are reported using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for informational transparency or quality of information and their interaction with *Home_EPU*. Firm-level controls and country controls are the same as those used in Table 2.4 Panel A and B. Model (1) uses baseline regression for the sample of emerging countries. Models (2) and (3) use *Institutional Ownership* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (4) and (5) use *Foreign Inst. Ownership* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (6) and (7) use *Analyst Following* as a proxy of informational and its interaction with *Home_EPU*. Models (8) and (9) use *Corporate Governance* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (10) and (11) use *Analyst Forecast Dispersion* as a proxy for quality of information and its interaction with *Home_EPU*. Models (12) and (13) use *Analyst Forecast Revision* as a proxy for quality of information and its interaction with *Home_EPU*. Appendix Table 2A provides definitions of variables.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Home_EPU	0.310***	0.416***	0.470***	0.454***	0.485***	0.429***	0.390***	0.292***	1.051	0.343***	0.342***	0.395***	0.395***
	(13.672)	(11.211)	(10.769)	(12.257)	(10.740)	(9.663)	(8.109)	(5.233)	(0.817)	(4.150)	(4.148)	(5.189)	(5.189)
Institutional Ownership		-6.879***	-3.558**										
		(-13.014)	(-2.051)										
Home_EPU*Institutional Ownership			-0.713*										
			(-1.883)										
Foreign Inst. Ownership				-7.215***	-4.895**								
				(-12.182)	(-2.415)								
Home_EPU*Foreign Inst. Ownership					-0.497								
					(-1.158)								
Analyst Following						-0.590***	-0.782***						
						(-14.291)	(-4.136)						
Home_EPU*Analyst Following							0.040						
							(1.014)						
Corporate Governance								-0.587**	0.329				
								(-1.999)	(0.232)				
Home_EPU*Corporate Governance									-0.196				
									(-0.594)				

Table 2.6 Panel A: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Emerging Countries (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Analyst Forecast Dispersion										0.000	-0.000		
										(1.277)	(-1.075)		
Home_EPU*Analyst Forecast Dispersion											0.000		
											(1.191)		
Analyst Forecast Revision												-0.000***	0.000
												(-7.950)	(0.043)
Home_EPU*Analyst Forecast Revision													-0.000
													(-0.126)
Size	-0.754***	-0.654***	-0.652***	-0.650***	-0.649***	-0.470***	-0.470***	-0.414***	-0.413***	-0.504***	-0.504***	-0.612***	-0.612***
	(-44.661)	(-26.307)	(-26.144)	(-25.857)	(-25.747)	(-13.417)	(-13.408)	(-4.701)	(-4.647)	(-9.939)	(-9.939)	(-15.828)	(-15.827)
GDP Per Capita	-1.462***	-1.221***	-1.219***	-1.320***	-1.322***	-0.045	-0.044	-0.391	-0.398	0.461	0.461	0.162	0.162
	(-10.740)	(-5.443)	(-5.425)	(-5.897)	(-5.895)	(-0.186)	(-0.184)	(-1.237)	(-1.255)	(0.948)	(0.948)	(0.415)	(0.415)
Average Monthly Price	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000***	-0.000***	-0.002***	-0.002***	-0.000	-0.000	-0.000	-0.000
	(-1.890)	(-1.901)	(-1.899)	(-1.942)	(-1.941)	(-3.062)	(-3.066)	(-3.224)	(-3.222)	(-1.361)	(-1.361)	(-1.405)	(-1.405)
Market Volatility	0.333***	0.309***	0.309***	0.302***	0.303***	0.244***	0.244***	0.253***	0.252***	0.278***	0.278***	0.326***	0.326***
	(28.695)	(20.556)	(20.577)	(20.156)	(20.245)	(11.441)	(11.427)	(9.164)	(9.076)	(8.641)	(8.641)	(9.730)	(9.731)
Market Return	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.006***	-0.006***	-0.003***	-0.003***	-0.008***	-0.008***	-0.009***	-0.009***
	(-20.143)	(-16.332)	(-16.266)	(-15.851)	(-15.823)	(-6.602)	(-6.636)	(-3.431)	(-3.383)	(-5.606)	(-5.607)	(-7.583)	(-7.582)
Constant	14.248***	10.912***	10.631***	11.651***	11.521***	-2.169	-1.991	2.622	-0.859	-7.756	-7.755	-4.110	-4.111
	(11.681)	(4.850)	(4.732)	(5.188)	(5.130)	(-0.916)	(-0.848)	(0.751)	(-0.136)	(-1.553)	(-1.553)	(-1.027)	(-1.027)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	534,530	158,183	158,183	158,183	158,183	104,286	104,286	34,157	34,157	23,423	23,423	36,396	36,396
R-Squared	0.709	0.513	0.513	0.512	0.513	0.378	0.378	0.257	0.257	0.350	0.350	0.452	0.452

t-stat in parentheses

*** p<.0.01, **p<0.05, and *p<0.10

Table 2.6 Panel B: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Developed Countries

This table presents the empirical results using panel regression for subsample analysis, including only developed countries in the sample. Countries are classified as developed using MSCI Index. Results of panel regression for hypotheses 2a and 2b are reported using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for informational transparency or quality of information and their interaction with *Home_EPU*. Firm-level controls and country controls are the same as those used in Table 2.4 Panel A and B. Model (1) uses baseline regression for the sample of developed countries. Models (2) and (3) use *Institutional Ownership* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (4) and (5) use *Foreign Inst. Ownership* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (6) and (7) use *Analyst Following* as a proxy of informational and its interaction with *Home_EPU*. Models (8) and (9) use *Corporate Governance* as a proxy of informational transparency and its interaction with *Home_EPU*. Models (10) and (11) use *Analyst Forecast Dispersion* as a proxy for quality of information and its interaction with *Home_EPU*. Models (12) and (13) use *Analyst Forecast Revision* as a proxy for quality of information and its interaction with *Home_EPU*. Appendix Table 2A provides definitions of variables.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Home_EPU	0.436***	0.373***	0.487***	0.383***	0.389***	0.357***	0.421***	0.213***	2.129***	0.186***	0.186***	0.225***	0.225***
	(34.825)	(30.123)	(30.598)	(31.031)	(27.030)	(25.144)	(23.339)	(7.818)	(8.702)	(32.527)	(32.491)	(36.413)	(36.411)
Institutional Ownership		-4.730***	-2.622***										
		(-86.364)	(-16.229)										
Home_EPU*Institutional Ownership			-0.446***										
			(-13.701)										
Foreign Inst. Ownership				-4.499***	-4.001***								
				(-28.220)	(-6.468)								
Home_EPU*Foreign Inst. Ownership					-0.104								
					(-0.864)								
Analyst Following						-0.787***	-0.486***						
						(-80.373)	(-9.183)						
Home_EPU*Analyst Following							-0.064***						
							(-5.814)						
Corporate Governance								-0.700***	1.455***				
								(-8.898)	(5.074)				
Home_EPU*Corporate Governance									-0.461***				
									(-7.780)				

Table 2.6 Panel B: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Developed Countries (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Analyst Forecast Dispersion										0.000***	-0.000***		
										(3.740)	(-2.676)		
Home_EPU* Analyst Forecast Dispersion											0.000***		
											(2.959)		
Analyst Forecast Revision												-0.000	-0.000
												(-1.397)	(-0.202)
Home_EPU*Analyst Forecast Revision													0.000
													(0.146)
Size	-1.024***	-0.827***	-0.826***	-1.002***	-1.002***	-0.752***	-0.752***	-0.731***	-0.731***	-0.895***	-0.895***	-0.969***	-0.969***
	(-182.514)	(-117.687)	(-117.614)	(-144.166)	(-144.126)	(-113.663)	(-113.627)	(-57.464)	(-57.616)	(-126.863)	(-126.863)	(-141.532)	(-141.532)
GDP Per Capita	1.428***	0.853***	0.805***	1.085***	1.084***	1.204***	1.207***	1.365***	1.352***	1.432***	1.432***	1.694***	1.694***
	(28.882)	(14.553)	(13.719)	(18.270)	(18.242)	(19.124)	(19.165)	(11.660)	(11.548)	(8.815)	(8.816)	(15.181)	(15.181)
Average Monthly Price	-0.000*	-0.000***	-0.000***	-0.000*	-0.000*	-0.000***	-0.000***	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.856)	(-3.022)	(-3.009)	(-1.932)	(-1.932)	(-2.702)	(-2.707)	(-0.463)	(-0.452)	(-0.172)	(-0.172)	(-0.151)	(-0.151)
Market Volatility	0.315***	0.311***	0.327***	0.336***	0.336***	0.395***	0.396***	0.374***	0.382***	0.414***	0.413***	0.396***	0.396***
	(70.490)	(66.979)	(69.339)	(70.132)	(70.025)	(76.174)	(76.463)	(37.687)	(38.115)	(113.479)	(113.493)	(102.825)	(102.827)
Market Return	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***	0.004***	0.004***	0.000	0.001**	0.009***	0.009***	0.007***	0.007***
	(-8.623)	(-4.965)	(-3.890)	(-4.543)	(-4.538)	(14.143)	(14.255)	(0.782)	(2.068)	(41.278)	(41.281)	(35.233)	(35.234)
Constant	-14.337***	-7.835***	-7.869***	-10.527***	-10.548***	-13.611***	-13.947***	-13.737***	-22.533***	-15.882***	-15.884***	-17.999***	-17.999***
	(-27.286)	(-12.489)	(-12.525)	(-16.526)	(-16.557)	(-20.356)	(-20.794)	(-10.416)	(-14.287)	(-9.113)	(-9.113)	(-15.007)	(-15.007)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,132,251	2,058,023	2,058,023	2,058,023	2,058,023	1,388,573	1,388,573	501,679	501,679	961,977	961,977	1,178,053	1,178,053
R-Squared	0.616	0.684	0.685	0.609	0.609	0.664	0.664	0.602	0.603	0.558	0.558	0.567	0.567

t-stat in parentheses

*** p<.0.01, **p<0.05, and *p<0.10

Table 2.7 Panel A: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Emerging Countries

This table presents the empirical results using panel regression for subsample analysis, including only emerging countries in the sample. Countries are classified as emerging using MSCI Index. Results are reported using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and a combination of proxy for informational transparency and quality of information and their interaction terms with *Home_EPU*. Firm-level controls and country controls are the same as used in Table 2.4 Panel A and B. Appendix Table 2A provides definitions of variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Home_EPU	0.450***	0.454***	0.420***	-1.191	0.531***	0.534***	0.422***	-1.475	0.451***	0.452***	0.415***	-1.149	-0.584	-0.329
	(4.201)	(4.145)	(4.297)	(-0.929)	(5.761)	(5.671)	(5.033)	(-1.181)	(4.132)	(4.068)	(4.233)	(-0.882)	(-0.601)	(-0.368)
Institutional Ownership	1.799				3.057				1.695					
	(0.817)				(1.400)				(0.776)					
Home_EPU* Institutional Ownership	-0.987**				-1.447***				-0.971**					
	(-2.135)				(-3.143)				(-2.119)					
Foreign Inst. Ownership		1.868				3.424				1.625			3.852	3.374
		(0.734)				(1.376)				(0.647)			(1.412)	(1.360)
Home_EPU*Foreign Inst. Ownership		-1.091**				-1.609***				-1.052**			-1.309**	-1.144**
		(-2.063)				(-3.108)				(-2.014)			(-2.350)	(-2.273)
Analyst Following			0.044				-0.092				0.035			0.189
			(0.212)				(-0.488)				(0.170)			(1.223)
Home_EPU*Analyst Following			-0.091**				-0.077**				-0.089**			-0.091***
			(-2.216)				(-2.025)				(-2.155)			(-2.787)
Corporate Governance				-1.731				-2.006				-1.691	-0.919	-0.764
				(-1.165)				(-1.412)				(-1.122)	(-0.734)	(-0.652)
Home_EPU* Corporate Governance				0.334				0.411				0.322	0.231	0.195
				(1.013)				(1.277)				(0.961)	(0.897)	(0.820)
Analyst Forecast Dispersion	-0.000	-0.000	0.000	-0.022					-0.000	-0.000	0.000	-0.022	-0.010*	-0.010*
	(-1.007)	(-1.004)	(0.136)	(-1.382)					(-1.007)	(-1.010)	(0.136)	(-1.380)	(-1.838)	(-1.961)
Home_EPU*Analyst Forecast Dispersion	0.000	0.000	-0.000	0.005					0.000	0.000	-0.000	0.005	0.002	0.002*
	(0.935)	(0.925)	(-0.103)	(1.353)					(0.935)	(0.930)	(-0.098)	(1.351)	(1.582)	(1.735)
Analyst Forecast Revision					0.000	0.000	-0.000	0.002	0.000	0.000	-0.000	-0.001	-0.003	-0.002
					(1.341)	(1.327)	(-0.040)	(0.679)	(1.106)	(1.087)	(-0.822)	(-0.640)	(-0.723)	(-0.530)

Table 2.7 Panel A: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Emerging Countries (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
*Home_EPU * Analyst Forecast Revision*					-0.000	-0.000	0.000	-0.000	-0.000	-0.000	0.000	0.000	0.001	0.000
					(-1.573)	(-1.560)	(0.002)	(-0.528)	(-1.265)	(-1.249)	(0.793)	(0.802)	(0.811)	(0.602)
Size	-0.528***	-0.525***	-0.398***	-0.227*	-0.572***	-0.567***	-0.443***	-0.274**	-0.529***	-0.525***	-0.396***	-0.229*	-0.374***	-0.334***
	(-14.123)	(-14.001)	(-6.912)	(-1.753)	(-16.265)	(-16.099)	(-9.261)	(-2.317)	(-13.833)	(-13.688)	(-6.777)	(-1.747)	(-8.326)	(-7.948)
GDP Per Capita	0.897	0.801	0.430	-0.356	0.430	0.305	0.242	-0.464	0.909	0.814	0.419	-0.390	-0.410	-0.244
	(1.480)	(1.326)	(0.867)	(-0.866)	(0.904)	(0.643)	(0.615)	(-1.267)	(1.465)	(1.317)	(0.833)	(-0.935)	(-1.481)	(-0.988)
Average Monthly Price	-0.000	-0.000	-0.000	-0.002**	-0.000*	-0.000*	-0.000	-0.002***	-0.000	-0.000	-0.000	-0.002**	-0.002**	-0.001**
	(-1.550)	(-1.583)	(-1.423)	(-2.515)	(-1.696)	(-1.732)	(-1.520)	(-2.736)	(-1.570)	(-1.607)	(-1.433)	(-2.498)	(-2.549)	(-2.485)
Market Volatility	0.293***	0.300***	0.295***	0.287***	0.337***	0.346***	0.326***	0.282***	0.298***	0.307***	0.306***	0.284***	0.276***	0.280***
	(8.736)	(8.978)	(9.174)	(10.006)	(12.147)	(12.458)	(8.713)	(11.296)	(8.413)	(8.658)	(9.364)	(9.651)	(11.004)	(12.748)
Market Return	-0.006***	-0.006***	-0.007***	-0.002	-0.008***	-0.007***	-0.008***	-0.004***	-0.007***	-0.007***	-0.008***	-0.002	-0.004***	-0.005***
	(-3.498)	(-3.430)	(-4.769)	(-1.484)	(-5.525)	(-5.389)	(-6.217)	(-3.286)	(-3.812)	(-3.738)	(-4.825)	(-1.622)	(-4.411)	(-4.160)
Constant	-12.239**	-11.346*	-8.224	5.477	-7.486	-6.335	-5.916	8.019	-12.336*	-11.447*	-8.115	5.700	3.185	0.377
	(-1.990)	(-1.850)	(-1.622)	(0.786)	(-1.549)	(-1.313)	(-1.474)	(1.203)	(-1.958)	(-1.823)	(-1.579)	(0.813)	(0.592)	(0.077)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,600	14,600	20,932	9,639	22,958	22,958	28,641	11,331	14,258	14,258	20,596	9,524	6,940	6,630
R-Squared	0.497	0.502	0.375	0.297	0.494	0.497	0.440	0.310	0.498	0.503	0.374	0.297	0.610	0.640

t-stat in parentheses

*** p<.0.01, **p<0.05, and *p<0.10

Table 2.7 Panel B: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Developed Countries

This table presents the empirical results using panel regression for subsample analysis, including only developed countries in the sample. Countries are classified as developed using MSCI Index. Results are reported using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and a combination of proxy for informational transparency and quality of information and their interaction terms with *Home_EPU*. Firm-level controls and country controls are the same as used in Table 2.4 Panel A and B. Appendix Table 2A provides definitions of variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Home_EPU	0.568***	0.212***	0.093***	1.319***	0.586***	0.248***	0.065***	-1.475	0.559***	0.211***	0.091***	1.352***	1.077***	1.217***
	(17.761)	(22.788)	(6.680)	(4.381)	(22.635)	(25.302)	(4.811)	(-1.181)	(17.353)	(22.618)	(6.582)	(4.481)	(3.908)	(4.642)
Institutional Ownership	-0.728***				-1.026***				-0.818***					
	(-3.131)				(-5.035)				(-3.497)					
Home_EPU* Institutional Ownership	-0.593***				-0.618***				-0.578***					
	(-12.183)				(-14.552)				(-11.812)					
Foreign Inst. Ownership		-0.837				-1.378**				-0.835			2.440***	1.958***
		(-1.593)				(-2.417)				(-1.584)			(3.590)	(3.123)
Home_EPU* Foreign Inst. Ownership		-0.278**				-0.253**				-0.277**			-0.791***	-0.641***
		(-2.565)				(-2.165)				(-2.552)			(-5.462)	(-4.822)
Analyst Following			-0.504***				-0.690***				-0.512***			0.252***
			(-11.038)				(-14.993)				(-11.197)			(4.738)
Home_EPU* Analyst Following			-0.025***				-0.006				-0.023**			-0.115***
			(-2.619)				(-0.635)				(-2.407)			(-9.946)
Corporate Governance				0.632**				-2.006				0.668**	0.431	0.525*
				(2.030)				(-1.412)				(2.148)	(1.500)	(1.902)
Home_EPU* Corporate Governance				-0.290***				0.411				-0.297***	-0.212***	-0.202***
				(-4.136)				(1.277)				(-4.229)	(-3.266)	(-3.274)
Analyst Forecast Dispersion	-0.000*	-0.000**	-0.000***	0.000					-0.000*	-0.000**	-0.000***	0.000	0.000	0.000
	(-1.721)	(-2.479)	(-2.934)	(0.253)					(-1.720)	(-2.485)	(-2.941)	(0.253)	(0.205)	(0.227)
Home_EPU* Analyst Forecast Dispersion	0.000**	0.000***	0.000***	-0.000					0.000**	0.000***	0.000***	-0.000	-0.000	-0.000
	(2.025)	(2.741)	(3.223)	(-0.226)					(2.021)	(2.746)	(3.230)	(-0.226)	(-0.208)	(-0.216)

Table 2.7 Panel B: Impact of Information Transparency and Quality on EPU- Liquidity Relationship for Developed Countries (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Analyst Forecast Revision					0.000	-0.000	-0.000	0.002	0.000	-0.000	-0.000	-0.000	0.000	-0.000
					(0.063)	(-0.280)	(-0.316)	(0.679)	(0.045)	(-0.250)	(-0.274)	(-0.444)	(0.400)	(-0.635)
Home_EPU Analyst Forecast Revision*					-0.000	0.000	0.000	-0.000	-0.000	0.000	0.000	0.000	-0.000	0.000
					(-0.105)	(0.227)	(0.221)	(-0.528)	(-0.084)	(0.201)	(0.184)	(0.328)	(-0.586)	(0.420)
Size	-0.763***	-0.895***	-0.743***	-0.644***	-0.786***	-0.964***	-0.752***	-0.274**	-0.766***	-0.897***	-0.744***	-0.644***	-0.586***	-0.525***
	(-87.357)	(-104.736)	(-108.548)	(-54.073)	(-92.042)	(-115.616)	(-113.466)	(-2.317)	(-87.275)	(-104.226)	(-108.062)	(-53.913)	(-43.163)	(-39.216)
GDP Per Capita	0.568***	0.926***	1.326***	2.588***	1.105***	1.385***	1.316***	-0.464	0.569***	0.921***	1.313***	2.581***	2.229***	1.976***
	(3.676)	(5.923)	(7.917)	(11.797)	(10.009)	(12.088)	(10.542)	(-1.267)	(3.632)	(5.801)	(7.775)	(11.681)	(10.459)	(9.429)
Average Monthly Price	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	-0.002***	-0.000	0.000	-0.000	0.000	0.000***	0.000
	(-1.243)	(0.240)	(-0.677)	(1.494)	(-1.366)	(0.236)	(-0.716)	(-2.736)	(-1.246)	(0.234)	(-0.681)	(1.505)	(3.011)	(1.142)
Market Volatility	0.385***	0.405***	0.475***	0.386***	0.367***	0.388***	0.474***	0.282***	0.384***	0.404***	0.475***	0.385***	0.380***	0.391***
	(103.171)	(97.922)	(116.367)	(70.650)	(92.492)	(89.213)	(112.828)	(11.296)	(102.630)	(97.507)	(116.637)	(71.422)	(65.513)	(63.115)
Market Return	0.009***	0.009***	0.012***	0.006***	0.007***	0.007***	0.012***	-0.004***	0.009***	0.009***	0.012***	0.006***	0.007***	0.009***
	(38.456)	(35.384)	(39.780)	(18.321)	(28.312)	(27.345)	(36.110)	(-3.286)	(38.313)	(35.477)	(40.019)	(18.410)	(21.366)	(21.672)
Constant	-7.179***	-10.540***	-14.928***	-33.858***	-12.515***	-14.761***	-14.383***	8.019	-7.112***	-10.460***	-14.769***	-33.940***	-29.919***	-28.592***
	(-4.365)	(-6.265)	(-8.303)	(-14.063)	(-10.679)	(-11.955)	(-10.746)	(1.203)	(-4.262)	(-6.127)	(-8.149)	(-13.899)	(-12.951)	(-12.745)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	680,406	680,406	752,608	243,267	839,354	839,354	831,907	11,331	675,346	675,346	748,379	242,342	175,061	159,740
R-Squared	0.657	0.552	0.609	0.528	0.671	0.562	0.623	0.310	0.659	0.552	0.609	0.527	0.526	0.548

t-stat in parentheses
*** p<.0.01, **p<0.05, and *p<0.10

Table 2.8: Robustness Checks

This table reports the results for four different models of robustness checks. The dependent variable is Amihud's measure of illiquidity (*Ami_illiquidity*). Appendix Table 2A provides definitions of variables. The numbers in parentheses represent t-stat. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Variables	(1)	(2)	(3)	(4)
Home_EPU	0.336***	0.338***	0.325***	0.425***
	(20.102)	(19.068)	(20.753)	(29.802)
US_EPU				0.136***
				(16.645)
Industry Sensitivity Dummy	-0.538***			
	(-5.294)			
Home_EPU*Industry Sensitivity Dummy	0.160***			
	(7.355)			
Ind Sensitivity Continuous		-0.522**		
		(-2.194)		
Home_EPU*Ind Sensitivity Continuous		0.322***		
		(6.333)		
GDP Growth			-0.054***	
			(-13.245)	
Inflation			-0.005	
			(-0.660)	
Interest rate spread			-0.013	
			(-1.090)	
Size	-1.012***	-1.021***	-0.981***	-0.969***
	(-184.424)	(-186.257)	(-98.972)	(-129.092)
GDP Per Capita	1.063***	1.077***	0.952***	0.593***
	(21.422)	(21.634)	(14.838)	(12.340)
Average Monthly Price	-0.000*	-0.000*	-0.000***	-0.000*
	(-1.817)	(-1.831)	(-3.428)	(-1.932)
Market Volatility	0.320***	0.318***	0.348***	0.345***
	(66.456)	(66.031)	(45.954)	(49.376)
Market Return	-0.004***	-0.004***	-0.007***	-0.008***
	(-16.339)	(-16.553)	(-21.368)	(-28.036)
Constant	-9.815***	-10.056***	-8.124***	-5.320***
	(-18.832)	(-19.179)	(-12.334)	(-10.861)
Time F.E.	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes
Observations	3,365,840	3,365,840	1,356,752	2,252,415
R-Squared	0.654	0.657	0.576	0.649

APPENDICES

Appendix Table 2A: Descriptions of Variables

This Table defines all the variables used in the paper along with their data source.

Home_EPU	Natural log of Economic Policy Uncertainty Index by Baker et al. (2016) (EPU index)	https://www.policyuncertainty.com/all_country_data.html
US_EPU	Natural log of the U.S. Economic Policy Uncertainty Index by Baker et al. (2016) (EPU index)	https://www.policyuncertainty.com/all_country_data.html
Ami Illiquidity	Amihud's illiquidity measure calculated following Amihud (2002)	Own computations using data from Datastream and CRSP
PQ Spread	Percent quoted spread calculated as Ask Price -Bid Price /((Ask Price+ Bid Price)/2) *100	Own computations using data from Datastream and CRSP
CHL Spread	Closing-High and Low spread measure of illiquidity calculated following Abdi and Ronaldo (2017)	Own computations using data from Datastream and CRSP
High-Low Spread	High-Low Spread measure of illiquidity calculated following Corwin and Schultz (2012)	Own computations using data from Datastream and CRSP
Modified LIQ	The modified measure of Liquidity calculated following Karoyli (2012)	Own computations using data from Datastream and CRSP
Institutional Ownership	Total institutional ownership ratio in the percentage of market capitalization	Factset
Foreign Inst. Ownership	Foreign institutional ownership ratio in the percentage of market capitalization	Factset
Analyst Following	Natural log of the number of analysts following a firm in the month t-1	IBES
Corporate Governance	Firm-level Corporate Governance Index constructed using the methodology of Aggarwal et al. 2008	Own computations using data from Datastream
Analyst Forecast Dispersion	The standard deviation of analyst earnings per share forecast divided by the absolute value of mean earnings forecast (consensus forecast)	Own computations using data from IBES

Analyst Forecast Revision	The difference between mean earnings forecast for month t and t-1, scaled by the absolute value of mean earnings forecast for the month t-1	Own computations using data from IBES
Size	Natural log of Total Assets in year n-1	Own computations using data from Compustat Global and Compustat North America
Average Monthly Price	The average stock price for the month	Own computations using data from Datastream and CRSP
Market Volatility	The volatility of value-weighted market returns calculated as the standard deviation of daily stock returns in month t	Own computations using data from Datastream and CRSP
Market Return	Value-weighted market returns are calculated based on daily returns and compounded over the month.	Own computations using data from Datastream and CRSP
Trading Volume	Total number of shares traded during the month t (in hundreds)	Datastream
GDP Per Capita	Natural log of GDP per capita in US$	WDI Indicators of World Bank
GDP Growth	GDP growth (annual %)	WDI Indicators of World Bank
Inflation	Inflation, GDP deflator (annual %)	WDI Indicators of World Bank
Interest rate spread	Lending rate minus deposit rate (%)	WDI Indicators of World Bank
Industry Sensitivity Dummy	Beta co-efficient from Home_EPU obtained by regressing value-weighted monthly stock returns for each industry based on Fama-French 48 industry classification on Home_EPU and market return. Industry Sensitivity Dummy is a dummy variable with a value of 1 if the beta is above the median and zero otherwise.	Own Computations
Ind Sensitivity Continuous	Beta co-efficient from Home_EPU obtained by regression value-weighted monthly stock returns for each of industry based on Fama-French 48 industry classification on Home_EPU and market return	Own Computations

Appendix Table 2B: Attributes Used to Calculate the Firm-level Corporate Governance Index

S.No.	Attributes of Firm Corporate Governance
1	Board size greater than five but less than sixteen
2	The company has a corporate governance committee
3	Audit committee composed only of independent outsiders
4	Compensation committee composed only of independent outsiders
5	Nomination committee composed only of independent outsiders
6	The CEO is not a board member
7	The company has a staggered board structure. - the staggered board structure is one where only a portion of directors is elected during a particular, fiscal year
8	The company has a poison pill (shareholder rights plan, macaroni defense, etc.)
9	The company has a golden parachute or other restrictive clauses related to changes of control
10	The company has a succession plan for executive management (key board members) in the event of unforeseen circumstances
11	The company has a supermajority vote requirement or qualified majority (for amendments of charters and bylaws or lock-in provisions)
12	The company's board members are generally elected with a majority vote
13	Shareholders have the right to call special meetings
14	The company requires shareholders' approval before the adoption of any stock-based compensation plans
15	Shareholders have the right to approve significant company transitions such as M&As (only majority, no supermajority requirement)
16	The company has a policy for ensuring equal treatment of minority shareholders, facilitating shareholder engagement, or limiting the use of anti-takeover devices
17	Shareholders may act by written consent
18	Company/Board of Directors is not authorized to issue a blank check without shareholders' approval
19	Board consists of more than 50% of independent outside directors
20	Board consists of more than 50% strictly independent board members (not employed by the company; not served on the board for more than ten years; not a reference shareholder with more than 5% of holdings; no cross-board membership; no recent, immediate family ties to the corporation; not accepting any compensation other than compensation for board service
21	The average overall attendance percentage of board meetings as reported by the company is greater than 75%
22	All non-audit fees divided by the audit and audit-related fees paid to the group auditor is less than 50%
23	Chairman and CEO are separate

Appendix Table 2C: Correlation Matrix for Liquidity Variables

This table provides Pearson's coefficients of correlation for all the five liquidity (illiquidity) measures used in the study. Appendix Table 2A provides definitions of variables.

Variables	***Ami_illiquidity***	***PQ Spread***	***CHL Spread***	***High-Low Spread***	***Modified LIQ***
Ami_illiquidity	1.000				
PQ Spread	0.119	1.000			
CHL Spread	0.134	0.609	1.000		
High-Low Spread	0.127	0.452	0.851	1.000	
Modified LIQ	-0.999	-0.122	-0.137	-0.130	1.000

CHAPTER 3

Does the U.S. Cross-Listing of a Non-U.S. Stock Influence the Impact of Economic Policy Uncertainty on Stock Liquidity?

Abstract

The extensive literature on cross-listing offers various motives to cross-list the shares in an international market, including improved stock visibility, decreased cost of capital, enhanced investor base, information disclosure, etc. Using a broad sample of twenty countries, I examine the role of cross-listing in shaping the uncertainty-liquidity relationship. I focus on the non-U.S. firms that cross-list in the U.S. market as American Depository Receipts (ADRs). I find that cross-listing in the U.S. market helps mitigate the negative impact of economic policy uncertainty on stock liquidity in the home market. The results are robust to the use of matched sample design.

Further analysis suggests that the benefit of cross-listing as a hedge against the adverse impact of economic policy uncertainty is contingent on home country characteristics. The U.S. cross-listing helps mitigate the negative impact of economic policy uncertainty on the domestic liquidity of stocks belonging to developed countries, common law countries, and countries with strong governance. In contrast, the impact is not statistically significant for the stocks from emerging countries, civil law countries, and countries with weak governance. The findings of my study support the information disclosure hypothesis for developed and strong governance countries, whereas for emerging and weak governance countries, market opaqueness dominates the firm-level information disclosure.

JEL classification: G10, G15, G18

Keywords: Cross-listing, Economic policy uncertainty, Stock liquidity, Information disclosure

3.1.Introduction

The accelerated pace of globalization in the financial markets has paved the way for internationalization for investors and firms. The phenomenon of cross-border capital flows is gaining importance around the world. Increased level of international investment provides evidence of investors' preference for international diversification.[6] International integration has started a new wave of competition among stock exchanges. Stock exchanges compete for more trading volume and hence more business opportunities. Stock exchanges are targeting foreign listing to win the race. At the same time, firms use international listing as a strategic tool to get a competitive edge both in product and financial markets. The international listing provides direct access to foreign capital (Pagano et al., 2002), which explicitly helps firms given the limited capacity of the domestic market (Lasfer, 2009).

Academic literature documents various motives of cross-listing like increased shareholders base, improved stock visibility, better investor protection, improved liquidity, and reduced cost of capital.[7] Merton (1987), recognizing the importance of information costs and institutional structures, develops a notable hypothesis called the '*investor recognition hypothesis*.' In his model of capital market equilibrium, he argues that information has a cost, and investors do not possess complete information about all stocks. Therefore, investors invest only in the stocks which they are aware of. Other things being equal, an increase in investor recognition reduces the expected

[6] According to Mid-Year 2019 Report by Citi Depository Services, the value of total depository receipts held by the U.S. institutional investors is $1.1 trillion as of second quarter of 2019, 76% of the total is held by mutual funds. In the first half of 2019, the trading volume increased by 8% compared to first half of 2018. According to Mid-Year 2020 Report, the depository receipts' trading volume increased by 49% compared to the first half of 2019.
(Source: https://depositaryreceipts.citi.com/adr/common/file.aspx?idf=5021, https://depositaryreceipts.citi.com/adr/common/file.aspx?idf=5357)

[7] See Karolyi (1998, 2006) for a detailed survey on international listing.

returns due to decreased "shadow cost" of unfamiliarity with the stock. In the spirit of Merton (1987), firms may cross-list their securities to reduce shadow cost.

Stapleton and Subrahmanyam (1977) present a *market segmentation* argument for cross-listing securities in an international market. Ownership restrictions, regulatory barriers to foreign investment, or differential tax implications can cause market segmentation. Such market imperfections may cause a differential in security pricing in different markets (Stulz, 1981; Black, 1974; Errunza and Losq, 1985; Eun and Janakiramanan, 1986). In the presence of market segmentation, firms have an incentive to adopt policies that can reduce the impact of such barriers. Cross-listing in a foreign market may help overcome segmentation barriers (Stapleton and Subrahmanyam, 1977; Foerster and Karolyi, 1999).

The *liquidity theory* of cross-listing suggests that cross-listing increases trading hours and the number of traders. Increased competition among traders results in a lower bid-ask spread. Amihud and Mendelson (1986) show that liquidity is a priced risk factor. According to liquidity theory, managers are motivated to cross-list their shares to improve stock liquidity and lower expected returns (Bancel and Mittoo, 2001; Houston and Jones, 2002; Bancel et al., 2009).

The *information disclosure* hypothesis suggests that cross-listing reduces firm-specific information asymmetry. A firm uses cross-listing to convey information about the firm's prospects (Fuerst, 1998). It provides the firms with a competitive edge in terms of trading volume (Huddart et al., 1999). The *bonding hypothesis* of Coffee (1999) argues that cross-listing helps to improve investor protection through bonding to an exchange with stricter legal and disclosure requirements that restricts expropriation by controlling shareholders and increases firm value. While the literature offers various hypotheses associated with motives to cross-list, the focus of this study is on the *information disclosure hypothesis*.

The literature on economic policy uncertainty documents the adverse effects of economic policy uncertainty on corporate decision-making and stock markets. There is a dearth of literature investigating the impact of economic policy uncertainty on stock liquidity at the international level with few exceptions, including Ma et al., 2019; Dash et al., 2019; and Zhang et al., 2021. The theoretical and empirical literature on the impact of uncertainty on stock liquidity suggests that uncertainty increases information asymmetry. Therefore, market makers either decide not to trade or increase the bid-ask spread as compensation for additional risk amid information asymmetry, thus reducing liquidity (Easley and O'Hara, 2010; Ozsoylev and Werner, 2011; Routledge and Zin, 2009; Chung and Chuwonganant, 2014; Rehse et al., 2019; Duong et al., 2020).

Liquidity is essential for different stakeholders. At the firm level, it helps to reduce the cost of capital. At the same time, for policy makers, liquidity ensures the mobility of capital and helps better resource allocation, and, finally for investors, it helps in making effective investment strategies.

Cross-listing helps to improve a firm's information environment, whereas economic policy uncertainty increases information asymmetry in the market. It raises a natural question: Does an improved information environment resulting from cross-listing help reduce the information asymmetry caused by economic policy uncertainty (EPU) and help mitigate the negative effect of EPU on stock liquidity? In the present study, I strive to answer this question. The main question for my study is: Does cross-listing help mitigate the negative effect of economic policy uncertainty on domestic liquidity? To answer this question, I use a sample of American depository receipts (ADRs), cross-listed in the U.S. from twenty developed and emerging countries over twenty-three years (1997-2019). Using the economic policy uncertainty index (EPU index) by Baker et al. (2016), to capture EPU and the illiquidity measure by Amihud (2002) to measure stock liquidity,

I find that cross-listing helps mitigate the detrimental impact of domestic EPU on stock liquidity in the domestic market.[8]

The U.S., being one of the strongest economies with the most liquid financial market, should have a spillover effect on other markets. Policy decisions of the U.S. government have a substantial impact on other countries. If there is a high level of economic policy uncertainty in the U.S., it should affect the domestic liquidity of the stocks from other countries due to the spillover effect. Therefore, the second main question of my study is: Does the U.S. EPU affect the domestic liquidity of foreign stocks? If yes, does cross-listing help mitigate the impact of the U.S. EPU on domestic liquidity of non-U.S. stocks? The results show that the U.S. EPU has a detrimental impact on the domestic liquidity of non-U.S. stocks. However, the results for the role of cross-listing in combatting the negative impact of the U.S. EPU on domestic liquidity are weak.

The information disclosure hypothesis suggests that cross-listing helps improve a firms' information environment through additional disclosure and hence more liquidity. Baker et al. (2002) and Lang et al. (2003) provide evidence of an increased level of analyst coverage for firms around U.S. cross-listing. Nevertheless, the impact of cross-listing may not be similar for all the countries. Ball (2001) emphasizes the importance of a country's legal, political, and economic infrastructure in improving a firm's reporting quality. Lang et al. (2006) argue that SEC regulations are not fully effective; instead, cross-listed firms' home environment continues to be relevant in improving firms' quality of reported earnings. To test whether the role of cross-listing is similar across countries, I run a sub-sample analysis. Consistent with the literature, my results support the

[8] I report all the results using illiquidity measure by Amihud (2002). I also run my baseline model using percent quoted spread (*PQ Spread*); closing high and low measure (*CHL Spread*) of Abdi and Ranaldo (2017); high low spread measure (*High-Low Spread*) of Corwin and Schultz (2012); and the modified version of Amihud's illiquidity measure (*Modified LIQ*) as used in Karolyi, Lee, and Van Dijk (2012) and find consistent results.

role of a home country's environment in determining the impact of cross-listing in shaping the EPU-liquidity relationship.

In my sub-sample analysis, I find that cross-listing provides a hedge against the detrimental impact of EPU on domestic liquidity for developed country firms and firms from countries with strong governance. However, cross-listing remains ineffective in mitigating the negative impact of EPU on the domestic liquidity of emerging country firms and firms from countries with weak governance. The results are consistent with the information disclosure hypothesis for developed country firms and firms from strong governance countries. However, market opaqueness dominates the firm-level information disclosure for emerging country firms and firms from weak governance countries. Investor protection in the home country also affects the role of cross-listing in shaping the EPU-liquidity relationship. The impact is significantly more substantial for common law country firms than the firms from civil law countries.

To the best of my knowledge, my study is the first that combines two strands of literature and offers new insights into cross-listing benefits. I add to the literature on the benefits of cross-listing by providing evidence on the role of cross-listing in combating the negative effect of EPU on stock market liquidity. My results are robust to using a matched sample of non-cross-listed stocks from the home country with the same 2-digit SIC code. Furthermore, my study uses a broad sample of international firms, including firms from both developed and emerging countries, which allows me to identify the country patterns.

The rest of the paper is organized as follows: Section 3.2 briefly describes international listing, emphasizing ADRs. Section 3.3 focuses on literature review and hypothesis development. Section 3.4 presents data and sample. Section 3.5 explains the research methodology. Section 3.6 presents empirical results, and the conclusion follows in section 3.7.

3.2. Process of International Listing (Cross-listing)

Cross-listing in a foreign market broadly takes two forms: direct and indirect listing. Direct listing refers to the listing of securities as ordinary shares on a foreign stock exchange. Indirect listing refers to listing ordinary stocks as depository receipts. The depository receipts issued in the U.S. are called American Depository Receipts (ADRs), and such receipts issued outside the U.S. are called Global Depository Receipts (GDRs). Cross-listing offers multiple advantages like the firm's visibility, enhancing investors' base, opportunity to raise new capital, reaping the benefits of more liquid and developed stock markets, etc. However, all these benefits come at the additional costs associated with cross-listing. The cost of cross-listing depends on the form of cross-listing *viz.* ordinary shares or ADRs/GDRs. The firms choose the cross-listing market and the form of cross-listing depending on their requirement along with the cost and benefits associated with them. The present study considers only ADRs as the means of cross-listing in the U.S. market.

3.2.1 ADRs

American Depository Receipts (ADRs) are financial instruments like equity securities issued by a depository bank in the U.S. Each ADR represents a fixed number of underlying shares of the issuer (domestic) company held by the depository bank in the issuer's home market. The number of shares against each ADR varies from company to company ranging from a fraction of a share to multiple shares. From an investor's perspective, ADRs are similar to U.S. securities in the sense that they are priced in USD, traded on U.S. stock exchanges (New York Stock Exchange - NYSE /Nasdaq/ Over-the-counter - OTC) according to the respective stock exchange's trading and settlement procedure, and the dividend is also received in USD. The depository banks create new depository receipts based on investor's demand against the stipulated number of shares being

deposited in their custodial account in the issuer's country.[9] Depository banks simply reverse the process to redeem the ADRs. Alternatively, investors can re-sell the ADRs on their respective listed stock exchange or in the over-the-counter (OTC) market. Investors may also surrender ADRs in exchange for underlying shares of the issuer company.

The first ADR was developed in 1927 by JP Morgan, a U.S. bank against the shares of a British department store. The ADRs were initially created to facilitate the U.S. investors seeking to invest in a foreign company. Gradually, these instruments gained popularity among investors as well as issuers. Today, various depository banks have more than 2000 active ADRs issued against the shares of companies from almost 70 countries.[10] ADRs offer advantages to the issuers regarding cost-effectiveness and less stringent disclosure requirements than direct listing as an ordinary share on a U.S. stock exchange. They win investors' confidence as all transactions (quotes and dividend payments) are in USD. They follow the trading and settlement procedure of listed exchanges, thereby minimizing the chances of trade failure.

3.2.2 Types of ADRs

ADR programs may be sponsored or unsponsored depending on the initiation and involvement of the issuer company. Under a sponsored ADR program, the issuer company willing to increase shareholders' base or raise capital from the foreign market, enters into a contract with a depository bank. The contract terms include an agreement on services like recordkeeping, dividend payments, and other services to the potential ADR holders. An unsponsored ADR program is initiated by the brokers or dealers, willing to exploit the liquidity of the U.S. trading

[9] For more details on Depository Receipt (DR) issuance and cancellation process refer to Table1 of Citibank's '*The Role of Depository Bank:* A Resource for Issuers in the U.S. and Global Securities Markets*'* (Issuer Services, 2018) https://depositaryreceipts.citi.com/adr/common/file.aspx?idf=1249

[10] https://www.sec.gov/investor/alerts/adr-bulletin.pdf

market. For both sponsored and unsponsored ADR programs, the issuer firm is subject to the compliance of disclosure and reporting requirements of the Security Exchange Act of 1934 unless exempted under the Act.

Market participants classify ADRs as Level I, Level II, or Level III ADRs depending on the trading platform and issuer's purpose. Level I ADRs trade on an over-the-counter exchange (OTC) and are exempt from U.S. reporting (SEC filing) requirements under Rule 12g3-2(b). However, to be able to trade in the U.S., issuers need to register with the SEC using Form F-6. Level II ADRs are listed on the U.S. stock exchanges like NYSE or Nasdaq, and the issuer is to abide by the rules and requirements of the respective stock exchange. Level II ADRs cannot raise capital. It requires registration and reporting under the Securities Act of 1933 and the Securities and Exchange Act 1934. Companies must file annual reports confirming the U.S. generally accepted accounting principles (GAAP) or international financial standards (IFRS), although they are exempt from complying with the state securities regulations. Such listings provide the issuer with additional advantages of increased visibility in the U.S. market, increased level of analyst coverage, access to institutional investors, and increased information about the security.[11] Under a Level III ADR program, the issuers can raise new capital in the U.S. market. Level III ADRs are required to meet strict reporting rules like the U.S. firms. The issuers need to register the securities to be issued using form F-1 besides complying with the U.S. generally accepted accounting principles (GAAP) or international financial standards (IFRS).

[11] https://www.citibank.com/mss/sa/flippingbook/2018/The-Role-of-the-Depositary-Bank//files/assets/common/downloads/The%20Role%20of%20the%20Depositary%20Bank.pdf
'*The Role of Depository Bank:* A Resource for Issuers in the U.S. and Global Securities Markets*'* (Issuer Services, 2018)

3.3. Literature Review and Research Questions

3.3.1 Economic Policy Uncertainty and Stock Liquidity

The theoretical and empirical literature on the impact of uncertainty on stock liquidity suggests an adverse effect of economic policy uncertainty on stock liquidity (Easley and O'Hara, 2010; Ozsoylev and Werner, 2011; Routledge and Zin, 2009; Chung and Chuwonganant, 2014; Rehse et al., 2019; Duong et al., 2020; Ma et al., 2019). The theoretical work of Ozsoylev and Werner (2011) and Routledge and Zin (2009) suggest, as uncertainty increases, the trading volume drops, and traders widen the bid-ask spread.

Chung and Chuwonganant (2014) show that market uncertainty, as measured by the VIX index, reduces market liquidity. The effect of market uncertainty is greater than the combined effect of the other determinants of liquidity. Rehse et al. (2019), using hurricane Sandy as a natural experiment, find a relatively low level of trading and wider bid-ask spreads for REITs with properties in uncertainty-affected areas than their counterparts without properties in those areas.

Duong et al. (2020) find that EPU adversely affects stock market liquidity for the U.S., and the impact is more pronounced during the global financial crisis period. They identify three channels, including information asymmetry, cash flow risk, and funding liquidity, through which economic policy uncertainty reduces market liquidity. Similarly, Debata and Mahakud (2018) find a moderate impact of economic policy uncertainty during normal conditions but a more pronounced impact during a financial crisis in an emerging order-driven stock market. Zhang et al. (2021) provide similar results for Chinese firms. They further show that the impact is more significant for the firms with an opaque information environment, weak risk resistance, and less investor attention. Ma et al. (2019), using an international sample of 57 countries, show that an increased level of investors' risk perception reduces market liquidity.

The literature suggests a decrease in stock market liquidity with an increase in economic policy uncertainty in a nutshell.

3.3.2 Cross-Listing and Liquidity

There is extant literature analyzing the benefits of international cross-listing. The significant benefits that the literature offers include an increased shareholders base (Saudagaran, 1988; Kadlec and McConnell, 1994; Karolyi, 1998, 2006; and Foerster and Karolyi, 1999); reduced cost of capital (Dhaliwal, 1980; Merton, 1987; Alexander et al., 1987; Foerster and Karolyi, 1999; Miller 1999; Errunza and Miller, 2000; and Baker et al., 2002); better investor protection (Stulz, 1999; Coffee, 1999, 2002; Reese and Weisbach, 2002; and Doidge et al., 2004); helpful in price discovery and stock price formation process (Eun and Sabherwal, 2003; Fernandes and Ferreira, 2008); improved liquidity (Houston and Jones, 2002; Bancel and Mittoo, 2001; Bancel et al., 2009; Karolyi, 1998, 2006; Silva and Chavez, 2008); facilitate foreign mergers and acquisitions (Saudagaran, 1988).

The '*liquidity theory*' of cross-listing suggests that cross-listing helps to improve stock liquidity. Since stock liquidity is a priced risk factor (Amihud and Mendelson, 1986; Pastor and Stambaugh, 2003), corporate managers strive to adopt financial policies to improve stock liquidity. Improved stock liquidity requires less illiquidity premium and translates into lower cost of capital (Dodd, 2013). Corporate managers, therefore, use cross-listing as a tool to improve liquidity and ultimately reduce the cost of capital. However, the literature provides mixed evidence on the impact of cross-listing on stock liquidity.

Domowitz et al. (1998) document an increase in stock liquidity of Mexican stocks following cross-listing in terms of a decrease in the spread in the Mexican stock market. They support the inter-market competition hypothesis. They further show intermarket information linkages as an

important determinant of cross-listing effects. However, they document a decrease in home market trading following cross-listing due to order-flow migration.

Foerster and Karolyi (1998), supporting the competition hypothesis, find a significant decrease in trading cost in the domestic market for Canadian stocks after cross-listing to the U.S. exchange. They further report a 28 percent increase in total trading volume, whereas a slight decline in domestic trading value of cross-listed Canadian stocks.

Smith and Sofianos (1997) find a 42 percent increase in combined (domestic and U.S.) trading value after cross-listing on NYSE. They show that the increase in trading value in the U.S. market is not at the cost of a decrease in the domestic market. Further, Mittoo (1997) documents a decrease in trading volume for the Canadian stocks domestically listed on the Vancouver stock exchange, whereas report an increase in the domestic trading volume for the stocks listed on the Toronto stock exchange.

Halling et al. (2008), using a broad sample of developed and emerging markets, find a significant increase in domestic turnover ratio following cross-listing. However, domestic trading activity increases only for developed markets. On the other hand, emerging markets do not record an increase in domestic trading activity following cross-listing in the U.S. They also examine the trading activity based on a country's insider trading protection and find that the trading volume, after cross-listing, decreases for countries with weak insider trading protection. In contrast, it increases for the countries with strong insider trading enforcement.

Silva and Chavez (2008) examine the liquidity costs of cross-listed and non-cross-listed stocks across countries for four emerging Latin American markets. They find that liquidity benefits in the domestic market of cross-listed stocks depend on firm size and market location. They find

cross-country differences in the impact of cross-listing on liquidity costs and attribute them to differences in investor protection among countries.

Berkman and Nguyen (2010), using the matched sample design, document a significant improvement in stock liquidity after cross-listing. However, after adjusting for the changes in contemporaneous liquidity of non-cross-listed stocks, they do not significantly improve the stock liquidity of cross-listed stocks. They argue that the cross-listing does not cause a permanent improvement in stock liquidity.

Alternatively, the literature favoring the *'Investor recognition hypothesis'* suggests that cross-listing improves investor recognition. The liquidity of a cross-listed stock improves as the foreign investors recognize the cross-listed stock after they are cross-listed in their home market. Therefore, investors prefer to invest in a foreign stock when they recognize it through cross-listing in the investors' home market over non-cross-listed foreign stock (Aggarwal et al., 2005; Ferreira and Matos, 2008; Ammer et al., 2012).

Another vein of the literature suggests that cross-listing is a way to reduce information asymmetry and helps to improve stock's information environment (Dodd, 2013). Fuerst (1998) develops a theoretical model of managers' choice of exchange to cross-list their stocks. In his model, corporate managers choose to cross-list their shares on an exchange with high disclosure requirements to convey private information to the investors about the firm's prospects. He further argues that it may give rise to an increase in the number of listings on exchange with stricter regulations.

Huddart et al. (1999), using a rational expectations model, examine the effect of disclosure requirements on the choice of cross-listing venue. Presenting the *'race-to-top'* argument, they show that stock exchanges gain a competitive advantage in trading volume through increased

disclosure requirements. It reduces the informational advantage of insiders by making firms disclose complete information. Liquidity traders choose to trade on such exchanges and minimize trading costs. Analogous to Huddart et al. (1999), Chemmanur and Fulghieri (2006) present a theoretical model supporting the role of cross-listings in reducing information asymmetry. Their model shows that amid heightened equity market information asymmetries, strict disclosure requirements of cross-listing exchange (venue) provide an informational advantage to the investors and reduce their monitoring cost.

Supporting the theoretical arguments, Khanna et al. (2004) find a higher level of liquidity for the firms that cross-list in the U.S. relative to their non-cross-listed domestic counterparts. Bailey et al. (2006) show an increase in trading volume following earnings announcement after U.S. cross-listing and attribute it to enhanced disclosure requirements for cross-listing in the U.S. High levels of disclosure requirements, therefore, are more likely to win investors' confidence and helps to improve stock liquidity.

It is clear from prior literature and the global evidence provided in section 3.3.1 and Chapter 2 of this dissertation that EPU adversely affects stock liquidity. However, the evidence concerning the effect of U.S. cross-listing on the home market liquidity of the stock is mixed. Also, the effect of cross-listing on the negative relationship between EPU and stock liquidity has not been investigated. In this essay, I attempt to fill that gap. In this essay, my first research question is how the U.S. cross-listing of a non-U.S. stock affects the indirect relationship between EPU and home market liquidity of the stock. I examine this question for both the U.S. and the home market EPU.

3.3.3 Home-country Characteristics and Cross-listing

The academic literature suggests variations in the impact of cross-listing across countries based on home country characteristics. Cross-listing may cause order flow migration from a less liquid emerging market to a more liquid developed financial market. Domowitz et al. (1998), in

their theoretical model, emphasize the importance of transparency or information linkages in determining the impact of cross-listing on market quality. Their model predicts that if intermarket information linkage is strong, cross-listing results in improved liquidity in both the home and foreign markets. On the other hand, poor information linkage causes a reduction in liquidity because of cross-listing. They argue that if the markets are transparent and have a high levels of information linkages, the new trading venue induces foreign investors' participation who would not have otherwise participated. Since the markets are transparent, increase intermarket competition due to cross-listing reduces spreads in both the markets. Conversely, in the case of inadequate information linkages, cross-listing leads to a diversion of order flow and may reduce domestic liquidity. However, imperfect linkages cause partial fragmentation because, on the one hand, increased intermarket competition may lead to high liquidity, while on the other hand, domestic liquidity will reduce due to order flow migration. They attribute the difference in impact to market segmentation (information linkages).

Halling et al. (2008) document a significant increase in the domestic turnover ratio of the cross-listed stocks for the firms based in developed countries. They do not observe a similar pattern for the firms based in emerging markets. While analyzing the impact of cross-listing based on enforcement of insider-trading rules, they document an increase in trading volume following cross-listing for the firms with strong insider-trading enforcement. The opposite is true for the firms with poor enforcement of insider trading. Levine and Schmukler (2006) find a significant drop in the domestic trading activity for emerging market firms that cross-list their shares in foreign markets. Fernandes and Ferreira (2008) document an asymmetrical impact of cross-listing on stock price informativeness for countries around the world. They find that cross-listing improves the information environment for firms from developed markets and deteriorates the information

environment of emerging market firms. Morck et al. (2000) and Jin and Myers (2006) attribute the differences in firm-specific return variations among developed and emerging countries to investor protection and accounting opaqueness. Morck et al. (2000) argue that intercorporate income shifting dominates firm-specific information in a country with poor investor protection, making it less useful to risk arbitrageurs.

Prior literature shows that home country characteristics influence the effect of U.S. cross-listing on the stock's liquidity in the home market. My second research question in this essay is an extension of the first research question. Specifically, the second research question is how the moderating role of U.S. cross-listing on the relationship between EPU and home market liquidity of the stock varies across countries based on their characteristics.

3.4.Data and Methodology

3.4.1 Sample Construction

In this study, I obtain the list of international stocks cross-listed on the U.S. market from Citi Bank's depository receipt services webpage, J.P.Morgan's depository receipts webpage, and Bank of New York (BNY) Mellon's depository receipts webpage.[12] I compile the lists from all three sources to get a comprehensive list of American Depository Receipts (ADRs). This list provides the information on country of origin, depository bank, ADR ratio, exchange of ADR listing, effective date, inactive date, status (active/inactive), along with the International Securities Identification Number (ISIN) for ADR as well as for ordinary listing in the home country. To avoid survivorship bias, I keep both active and inactive ADRs in my sample from January 1, 1997, to December 31, 2019. This way, I obtain a list of 4,887 depository receipts. I then only keep the

[12] https://depositaryreceipts.citi.com/adr/guides/uig.aspx?pageId=8&subpageID=34
https://www.adr.com/dr/drdirectory/drUniverse
https://www.adrbnymellon.com/directory/dr-directory

ADRs listed on NYSE, Nasdaq, and OTC market in the U.S. and am left with a list of 2,230 ADRs. I collect the daily market data for ADRs and ordinary listing from Datastream based on the ISIN. I collect all the information in U.S. dollars. I keep the observations between the effective date and inactive date for the delisted stocks. For the currently cross-listed stocks, I keep the observations from January 1, 1997, or cross-listing date, whichever is later until December 31, 2019. At this stage, I am left with 1,492 cross-listed stocks with available information. Forty-nine of these stocks are cross-listed on Nasdaq, 131 are cross-listed on NYSE, and 1,312 are cross-listed on OTC.[13]

In my final sample, I have the stocks from 20 countries cross-listed in the U.S.; this includes Australia, Belgium, France, Germany, Ireland, Italy, Japan, Netherlands, Singapore, Spain, Sweden, United Kingdom, Brazil, Chile, Colombia, Greece, India, Mexico, and Russia. Twelve of the sample countries are developed, and the other eight are emerging.

I collect fundamental information from Compustat Global. The information in Compustat Global is in the local currency, so I convert it to U.S. dollars based on the exchange rate information collected from Datastream. I collect macroeconomic control variables from the World Development Indicators (WDI) of the World Bank. I divide the countries as developed or emerging following the MSCI Index. To identify the countries with strong and weak governance, I use an aggregate of all six components of World Governance Indicators (WGI) by Kaufmann et al. (2010). This data is available from the World Bank database. I divide the aggregate index into terciles, the countries in the first tercile are weak governance countries, and the countries in the third tercile are strong governance countries. I divide the countries as Civil or Common law countries following La Porta et al. (1998).

[13] Table 3.1 and Figure 3.1, 3.2 and 3.3 provides country wise list of cross-listed stocks.

3.4.2 Measure of Economic Policy Uncertainty

Economic policy uncertainty is one of the main variables of interest in my study. I measure economic policy uncertainty using the EPU index developed by Baker et al. (2016) for Australia, Brazil, Canada, France, Germany, India, Italy, Mexico, South Korea, Russia, United Kingdom, and the United States; Cerda et al. (2016) for Chile; Gil and Silva (2018) for Colombia; Hardouvelis et al. (2018) for Greece; Zalla (2016) for Ireland; Arbatli et al. (2019) for Japan; Kroese et al. (2015) for the Netherlands; Davis (2016) for Singapore; Ghirelli et al. (2019) for Spain; and Armelius et al. (2017) for Sweden. EPU index is a news-based index that counts the number of news articles in leading newspapers, containing information on economic policy decisions or any non-economic policy matters with expected economic effects. It includes the articles containing a combination of keywords covering three areas, *viz*. uncertainty, policy, and economy. It uses different keywords or variations thereof from the three areas. The keywords include "uncertainty" or "uncertain"; "deficit"; "congress"; "Federal Reserve"; "legislation"; "regulation"; "White House"; "economy" or "economic" from the leading newspapers of the respective country. The set of policy-related terms differ across countries (e.g., using "RBI," "Reserve Bank," "Prime Minister's Office," "PM Office," "Lok Sabha," "excise duties," and "customs duties" for India, and using "Bank of Japan," "BOJ" for Japan). The raw counts are scaled by the total number of articles in that newspaper in a month to control for volume variations across newspapers and time. These numbers are then standardized to unit standard deviation over time and averaged across the newspapers in that country every month.

3.4.3 Stock Liquidity Measure

In the present study, I use daily data for returns, bid, ask, high, low, or closing prices. The liquidity literature offers different liquidity measures using daily data. Following prior literature, I use five different low-frequency liquidity measures, including percent quoted spread (*PQ*

Spread); closing high and low measure (*CHL Spread*) of Abdi and Ranaldo (2017); high low spread measure (*High-Low Spread*) of Corwin and Schultz (2012); Amihud's illiquidity measure (*Ami_Illiquidity*); and the modified version of Amihud's illiquidity measure (*Modified LIQ*) as used in Karolyi et al. (2012). I present my baseline results using all five liquidity measures and use Amihud's illiquidity (*Ami_Illiquidity*) throughout the rest of the analysis. Liquidity literature (Acharya and Pedersen, 2005; Avramov et al., 2006; Mahanti et al., 2008; Dick-Nielsen et al., 2012; Karolyi et al., 2012; Amihud et al., 2015, among others) extensively uses Amihud's illiquidity measure to capture the price impact. Using low-frequency data, Amihud's illiquidity measure is the best liquidity proxy for global research (Fong et al., 2017). It measures the daily price response per dollar of the trading volume. The illiquidity measure is calculated as the monthly average of the ratio of daily absolute stock returns to the dollar trading volume for that day.

$$Ami\_Illiquidity_{i,d} = 1/\mathrm{N}_{i,d} \left(\sum_{\mathrm{N}i,}^{d} \frac{|R_{i,d}|}{P_{i,d} * V_{i,d}} \right)$$

Where $R_{i,d}$ is the dollar return by of stock i on day d. $P_{i,d}$ is the dollar price of stock i on day d, and $V_{i,d}$ is the trading volume of stock i on day d.

To reduce the impact of outliers, following Karolyi et al. (2012), I modify Amihud's illiquidity measure and multiply the measure by -1 to make the interpretation simpler. The modified version of Amihud's illiquidity measure (*Modified LIQ*$_{i,d}$) is:

$$Modified\ LIQ_{i,d} = -\log\left(1+\frac{|\mathrm{R}_{i,d}|}{P_{i,d} * V_{i,d}}\right)$$

Where *Modified* $LIQ_{i,d}$ is a modified version of Amihud's liquidity measure. $R_{i,d}$ is the dollar return of stock *i* on day *d*. $P_{i,d}$ is the dollar price of stock *i* on day *d*, and $V_{i,d}$ trading volume of stock *i* on day *d*.

Abdi and Ranaldo (2017) offer a new measure of liquidity based on closing, high and low prices. The rationality of the measure lies in the fact that transaction costs depart the security price from its efficient value. It is an improved version of Roll (1984) as it uses a richer information set and independent of order-flow dynamics. This method provides better estimates than Corwin and Schultz (2012) and Roll (1984) and other liquidity measures. Since it is less sensitive to the number of trades per day, it provides more accurate estimates for thinly traded securities. The spread measure of Abdi and Ranaldo (2017) is:

$$CHL\ Spread_t = 2\sqrt{E[(c_t - \eta_t)(c_t - \eta_{t+1})}$$

Where c_t is the log of the daily closing price for day *t*; η_t is the average of daily high and low log prices for day *t* and η_{t+1} is the average of daily high and low log prices for day *t+1*.

I also use the high-low spread estimator of Corwin and Schultz (2012). This measure performs better than the other liquidity proxies as a high-low percent-cost proxy (Fong et al., 2017). I calculate this measure as:

$$High\text{-}Low\ Spread = \frac{2(e^{\alpha}-1)}{1+e^{\alpha}}$$

$$\text{where } \alpha = \frac{\sqrt{2\beta}-\sqrt{\beta}}{3-2\sqrt{2}} - \sqrt{\frac{\gamma}{3-2\sqrt{2}}};\ \beta = \sum_{j=0}^{1}\left[\ln\left(\frac{H^0_{t+j}}{L^0_{t+j}}\right)\right]^2 \text{ and } \gamma = \left[\ln\left(\frac{H^0_{t,t+1}}{L^0_{t,t+1}}\right)\right]^2$$

$H^0_{t,t+1}$ and $L^0_{t,t+1}$ are the observed high and low prices from time t to t+1, respectively.

Finally, I also use the percent quoted spread, the most commonly used measure of liquidity. I calculate the percent quoted spread as:

$$PQ\ Spread_{i,d} = \text{Ask Price}_{i,d} - \text{Bid Price}_{i,d} / ((\text{Ask Price}_{i,d} + \text{Bid Price}_{i,d})/2) * 100.$$

The subscript *i* and *d* here refer to the stock *i* on day *d*. This measure is calculated following Chung and Zhang (2014). Fong et al. (2017) analyze low-frequency proxies and find that overall, the percent quoted spread is the best percent-cost liquidity proxy.

For the above measures, I first calculate the daily liquidity and then average it over the month to calculate the monthly liquidity at the security level.

3.4.4 Controls

I control for average monthly stock price, gross domestic product (GDP) per capita, market volatility, and value-weighted market return as standard macro-level controls. GDP per capita controls for the country's level of development, market volatility controls for the market's systematic risk, and average monthly stock price controls for the effect of discreteness (Stoll, 2000).

3.5. Research Methodology

I use the following model to answer my first question:

$$LIQ_{j,i,t} = \alpha + \beta_0 Home\_EPU_{i,t} + \beta_1 Cross\_Listed_{j,i,t} + \beta_2 Home\_EPU_{i,t} * Cross\_Listed_{j,i,t} + \gamma Controls_{i,t} + \epsilon_{i,t} \quad (1)$$

$LIQ_{j,i,t}$ is stock illiquidity calculated using Amihud's measures of illiquidity for stock *j*, country *i* in month *t*. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock *j*, from country *i* in month *t* is cross-listed in the U.S. and zero otherwise. *Controls* represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock *j* in month *t*, *GDP per Capita*, *Market Volatility*, and

Market Return. I also validate my results controlling for the U.S. economic policy uncertainty using the following model:

$$LIQ_{j,i,t} = \alpha + \beta_0 Home\_EPU_{i,t} + \beta_1 Cross\_Listed_{j,i,t} + \beta_2 Home\_EPU_{i,t} * Cross\_Listed_{j,i,t} + \beta_3 US\_EPU_t + \gamma Controls_{i,t} + \epsilon_{i,t} \quad (2)$$

$US\_EPU_{i,t}$ is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*.

To study the role of cross-listing in moderating the impact of U.S. economic policy uncertainty on stock liquidity, I use the following model:

$$LIQ_{j,i,t} = \alpha + \beta_0 US\_EPU_t + \beta_1 Cross\_Listed_{j,i,t} + \beta_2 US\_EPU_t * Cross\_Listed_{j,i,t} + \gamma Controls_{i,t} + \epsilon_{i,t} \quad (3)$$

$LIQ_{j,i,t}$ is stock illiquidity calculated using Amihud's measures of illiquidity for stock *j*, country *i* in month *t*. $US\_EPU_{i,t}$ is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock *j*, from country *i* in month *t* is cross-listed in the U.S. and zero otherwise. *Controls* represent different control variables that include Average *Monthly Price* calculated as the simple average of daily closing price of stock *j* in month *t*, *GDP per Capita*, *Market Volatility*, and *Market Return*. Additionally, I control for the home economic policy uncertainty to validate the findings and use the following model:

$$LIQ_{j,i,t} = \alpha + \beta_0 US\_EPU_t + \beta_1 Cross\_Listed_{j,i,t} + \beta_2 US\_EPU_t * Cross\_Listed_{j,i,t} + \beta_3 Home\_EPU_{i,t} + \gamma Controls_{i,t} + \epsilon_{i,t} \quad (4)$$

I use Model (1) through (4) on the sub samples based on three country characteristics (emerging and developed countries; civil and common law countries; weak and strong governance countries).

3.6.Empirical Results

3.6.1 Descriptive Statistics

Table 3.1 provides a country-wise list of stocks cross-listed in the U.S. market. Column (3) of the table provides the number of cross-listed stocks included in the final sample, which have valid data on the home country listing. Japan has the highest number of stocks cross-listed in the U.S., followed by the U.K. and Australia. Amongst the emerging countries, Brazil has the maximum number of listings in the U.S., followed by Mexico. Overall, developed countries find the U.S. a better alternative for cross-listing compared to the emerging market as 1,273 out of a total 1,492 cross-listed stocks are from developed countries. It may be attributed to the additional disclosure requirements of the U.S. stock market and the inability of emerging market firms to fulfill those requirements. Column (4) of Table 3.1 provides the list of ADRs for which I have valid data for both the U.S. market and the home market.

Table 3.2 reports the time-series averages of some selected variables for all 20 countries in the sample. It shows that Belgium has the highest level of illiquidity amongst the developed countries, followed by Germany. Amongst the emerging countries, India reports the highest level of illiquidity, followed by Russia and Greece. Overall, India reports the highest illiquidity because India has many listed stocks, but only a few are liquid, and the rest are not traded much.

3.6.2 Cross-Listing and Economic Policy Uncertainty-Liquidity Relationship

This section answers two of the major questions of my study, which are:

Does cross-listing help combat the negative effect of home market economic policy uncertainty on stock liquidity? Does U.S. economic policy uncertainty affect stock liquidity in the home market? If yes, is there a significant difference in the impact of U.S. economic policy uncertainty for the stocks that cross-list in the U.S. relative to non-cross-listed stocks?

I use Model (1) through (4) to examine the role of cross-listing in altering the economic policy uncertainty-liquidity relationship. Monthly stock liquidity is the dependent variable. I use Amihud's illiquidity (*Ami_illiquidity)* measure of stock liquidity. It effectively measures illiquidity; therefore, a higher value means lower liquidity. Table 3.3 reports the results of ordinary least square regression. I use time and country fixed effects. The standard errors are clustered at the firm level. I use the standard controls throughout my analysis. Column (1) of Table 3.3 shows that a 1% increase in home country economic policy uncertainty reduces stock liquidity by .366%.

The negative and significant coefficient on cross-listing shows that the liquidity of cross-listed stocks is significantly higher than the liquidity of their non-cross-listed domestic counterpart. Column (2) of Table 3.3 uses the interaction term of home market economic policy uncertainty with the cross-listed dummy. The coefficient of the interaction term is negative and significant at 1%. It shows that a 1% increase in home economic policy uncertainty reduces the stock liquidity by .40%. The liquidity of cross-listed stocks is greater than the liquidity of non-cross-listed stocks by .49%. Since the U.S. market dominates, the results in columns (1) and (2) may be due to the U.S. economic policy uncertainty. In columns (3) and (4), I control for the U.S. economic policy uncertainty and find consistent results to deal with this issue. Home market economic policy uncertainty still adversely affects the stock liquidity. Cross-listing helps mitigate this adverse effect of home market economic policy uncertainty even after controlling for the U.S. EPU.

To answer the second question, I run Model (3) and (4), and the results are presented in columns (5) through (7). I find that cross-listing helps combat the negative impact of the U.S. EPU on the domestic liquidity of cross-listed stocks. Column 8 of Table3.3 shows that after including domestic and the U.S. economic policy uncertainty and their interaction terms together in one model, cross-listing still helps combat the negative impact of domestic economic policy

uncertainty on stock liquidity. However, cross-listing worsens the effect of U.S. economic policy uncertainty on stock liquidity.The results support the information disclosure hypothesis. The investors in the domestic market view cross-listed stocks with more confidence because of the informational advantage of cross-listed stocks.

Overall, the findings of the empirical analysis suggest that domestic liquidity of cross-listed stocks is significantly higher than their non-cross-listed domestic counterpart. Cross-listing helps combat the negative impact of domestic markets' economic policy uncertainty on stock liquidity. The results hold even after controlling for U.S. economic policy uncertainty. The findings are consistent with the information disclosure hypothesis. However, in some model specifications, cross-listing does not seem to combat the negative impact of U.S. economic policy uncertainty on stock liquidity

3.6.3 Subsample Analysis

Table 3.4 Panel A and B report the results for the impact of domestic and the U.S. EPU on domestic liquidity of developed and emerging country firms, respectively. I classify the markets as developed or emerging using MSCI classification.

A perusal of Column (1) of Table 3.4 Panel A shows that using a full sample of non-cross listed stocks, a 1% increase in domestic EPU increases stock illiquidity by .377%. The liquidity of cross-listed stocks is higher than the non-cross listed stocks by 4.648%. Column (2) of Table 3.4 Panel A shows that cross-listing helps improve stock liquidity of developed market firms during heightened uncertainty. Columns (3) and (4) show that the U.S. EPU negatively affects the domestic stock liquidity of developed market firms. Results are consistent even after controlling for the U.S. EPU. Columns (6) and (7) show that cross-listing helps mitigate the negative effect of the U.S. EPU on domestic stock liquidity of developed country firms.

Table 3.4 Panel B reports the results for the impact of domestic and U.S. economic policy uncertainty on domestic stock liquidity for emerging countries. Column (1) shows that using a full sample of non-cross listed stocks, a 1% increase in domestic EPU increases stock illiquidity by .277%. The liquidity of cross-listed stocks is higher than the non-cross listed stocks by 3.302%. The interaction term (*Home_EPU*Crosslisting*) is insignificant in Column (2) of Table 3.4 Panel B. It shows that cross-listing does not provide a hedge against the effect of domestic EPU on domestic liquidity for emerging country firms. The results are consistent across all models.

Table 3.5 Panel A and B report the results for the impact of domestic and the U.S. EPU on domestic liquidity of common and civil law country firms, respectively. I use La Porta et al. (1998) to classify the countries as common law or civil law countries.

A perusal of Column (1) of Table 3.5 Panel A shows that using a full sample of non-cross listed stocks, a 1% increase in domestic EPU increases stocks illiquidity by .213% for common law country stocks. The liquidity of cross-listed stocks is higher than the non-cross listed stocks by 4.659%. Column (2) of Table 3.5 Panel A shows that cross-listing helps improve stock liquidity of common law country firms during heightened uncertainty. Columns (3) and (4) show that the U.S. EPU negatively affects the domestic stock liquidity of common law country firms. Results are consistent even after controlling for the U.S. EPU. Columns (6) and (7) show that cross-listing helps mitigate the negative effect of the U.S. EPU on domestic stock liquidity of developed country firms. In column (8), including domestic and the U.S. EPU and interacting both uncertainties with cross-listing, the coefficient for *Home_EPU*Crosslisting* is still negative and significant, confirming the role of cross-listing in mitigating the detrimental impact of domestic EPU on domestic liquidity.

Table 3.5 Panel B reports the impact of domestic and U.S. economic policy uncertainty on domestic liquidity for civil law country stocks. Column (1) shows that a 1% increase in domestic EPU increases stock illiquidity by .337%. The liquidity of cross-listed stocks is higher than the non-cross listed stocks by 4.358%. The interaction term (*Home_EPU*Crosslisting*) in Column (2) of Table 4 Panel B is negative and significant at 5%.

To understand further if the role of cross-listing in hedging the EPU risk on liquidity is significantly different for common and civil law country stocks, I run a test to compare the beta coefficients. I compare the beta coefficients of the interaction term (*Home_EPU*Crosslisting*) in columns (2,4 and 8) of Table 3.5 Panel A with the corresponding coefficients in Panel B of Table 3.5. The results are significant, indicating a stronger impact of cross-listing for common law country stocks relative to civil law country stocks.

Table 3.6 Panel A and B present the results for the impact of domestic and the U.S. EPU on domestic liquidity of firms from weak and strong governance countries, respectively. I calculate the aggregate of all six components of world governance indicators by Kaufmann et al. (2010). Then I divide the aggregate score into terciles. The countries in tercile 1 are weak governance countries, and the countries in tercile 3 are strong governance countries.

An examination of Column (1) of Table 3.6 Panel A shows that using a full sample of non-cross listed stocks, a 1% increase in domestic EPU increases illiquidity by .181% for the stocks of weak governance countries. The liquidity of cross-listed stocks is higher than the non-cross listed stocks by 3.960%. Column (2) of Table 3.6 Panel A shows that cross-listing does not provide a hedge against EPU risk for liquidity of weak governance country stocks during heightened uncertainty. The results are consistent across all the columns. Further results in columns (3) through (8) show that the U.S. EPU negatively affects the liquidity of weak governance country

stocks. Cross-listing does not help mitigate the negative impact of the U.S. EPU on the domestic liquidity of weak governance country stocks.

Table 3.6 Panel B reports the results for the impact of domestic and U.S. economic policy uncertainty on domestic liquidity of strong governance country stocks. Column (1) shows that a 1% increase in domestic EPU increases stock illiquidity by .118%. The liquidity of cross-listed stocks is significantly higher than the non-cross listed stocks by 4.494%. The interaction term (*Home_EPU*Crosslisting*) in Column (2) of Table 3.6 Panel B has a negative and highly significant coefficient which shows that for the stocks of strong governance countries, cross-listing helps combat the negative effect of domestic EPU on liquidity. The results are consistent across all the columns of Table 3.6 Panel B. Columns (3) through (8) show that the U.S. EPU negatively affects domestic liquidity. The interaction term (*US_EPU*Crosslisting*) in Columns (6) and (7) has a negative and significant coefficient which shows that cross-listing helps combat the negative effect of U.S. EPU. In column (8), however, when I include both the interaction terms, cross-listing still helps combat the negative effect of domestic EPU on liquidity, but it does not help to mitigate the impact of the U.S. EPU.

Consistent with prior literature (Halling et al., 2008; Fernandes and Ferreira, 2008; Morck et al., 2000; and Domowitz et al.,1998), I find that cross-listing helps mitigate the detrimental effect of EPU on liquidity for developed country stocks and strong governance country stocks, but not for the stocks of emerging and weak governance countries. My results support the information disclosure hypothesis for stocks of developed countries and the countries with strong governance. But for emerging countries and countries with weak governance, market opaqueness dominates the firm-level information disclosure. Additionally, better investor protection complements cross-listing in combatting the negative impact of EPU on stock liquidity.

3.6.4 Robustness Tests

Literature establishes significant firm-level cross-sectional differences in the level of liquidity (Camilleri and Galea, 2019; Banerjee et al., 2007; Amihud, 2002, among others). Companies' decisions to cross-list their shares abroad depend on *ex-ante* characteristics.[14] Thus, my analysis based on the full sample of non-cross-listed firms might capture the impact of other firm-level cross-sectional differences rather than the impact of cross-listing. To deal with this issue, I use matched sample design. Following Berkman and Nguyen (2010), I obtain a matched sample for each stock included in my cross-listed sample. I create a matched sample for each of the stocks in my sample of cross-listed stock from non-cross listed stocks that belong to the same domestic country and the same industry based on 2-digit SIC code and are closest to the cross-listed stock in terms of the market value of equity in that year. Table 3.7 uses matched sample design following Berkman and Nguyen (2010) and find consistent results for the impact of domestic economic policy uncertainty on stock liquidity. Cross-listing helps to mitigate the negative impact of domestic and U.S. EPU on stock liquidity. In column 8 of Table 3.7, after including domestic and U.S. EPU together, I observe a similar role of cross-listing for domestic EPU, but cross-listing does not seem to help with the U.S. EPU.[15]

One of the potential concerns with using the EPU index as a measure of economic policy uncertainty arises from the methodology used to create the index. Since the index captures uncertainty based on the news articles containing a trio of the terms referring to economy, policy,

[14] Pagano et al. (2002) find that the size of companies that cross-list their shares is significantly larger than the non-cross-listed domestic companies. Cross-listing decision is associated with exceptional growth and international orientation. Apart from firm size, Saudagaran (1988) documents a significant association between cross-listing and percentage of foreign sales.

[15] I also match the firms based on closest size and find similar(unreported) results.

and uncertainty, it might capture macro-economic uncertainty rather than economic policy uncertainty. To deal with this issue, I control for the additional macroeconomic variables in the analysis following Duong et al. (2020) and Bloom (2009). Table 3.8 presents the results for Models 1 through 4 using additional macro controls, which might capture macro-economic uncertainty. The additional controls include, GDP growth, Inflation, and Interest rate spread. The results across all 8 columns are consistent with my main results.

My results are robust to the use of different measures of illiquidity/liquidity. Similar to essay one, I run my baseline regression using *PQ Spread, CHL Spread, H-L Spread, and Modified LIQ* measure as the dependent variables. Table 3.9 reports the results using four different measures of illiquidity (liquidity). The results are consistent across all liquidity measures.

Overall, the results are consistent with the use of matched sample design, additional macro controls, and different liquidity measures.

3.7.Conclusions

If cross-listing improves a firm's information environment as suggested by the *information disclosure* hypothesis, it should help when the level of information asymmetry in the market is high caused by economic policy uncertainty. The literature on economic policy uncertainty provides evidence of its detrimental impact on stock liquidity. I, therefore, predict that cross-listing helps mitigate the negative impact of economic policy uncertainty on stock liquidity. I provide evidence documenting the results consistent with the prediction. The further analysis emphasizes the importance of the home country environment in assessing the role of cross-listing as a hedge against the adverse effect of economic policy uncertainty. The U.S. cross-listing helps mitigate the negative impact of economic policy uncertainty on the domestic liquidity of stocks belonging to developed countries and countries with strong governance. In contrast, the impact is not

statistically significant for the stocks from emerging countries and the countries with weak governance. The role of cross-listing in mitigating the negative effect of EPU on stock liquidity is stronger for common law countries than civil law countries. The findings of my study support the information disclosure hypothesis for developed countries and countries with strong governance, whereas for emerging and weak governance countries, market opaqueness dominates the firm-level information disclosure. My study contributes to the literature on the benefits of cross-listing by establishing cross-listing as a hedge against the detrimental impact of EPU. Since the role of country-level information asymmetry remains significant, my study has implications for policymakers. It suggests that regulators need to improve the governance mechanism and information environment to ensure better liquidity.

3.8.References

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TABLES AND FIGURES

Table 3.1: Summary Statistics of Cross-listed Stocks by Country

This table provides the country-wise list of cross-listed stocks with valid information. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically. The first two columns present the country and its ISO code. Column (3) provides the number of cross-listed stocks with valid data on the home country listing. Column (4) provides the number of ADRs with valid data for both the U.S. and home markets.

(1)	(2)	(3)	(4)
Country	**ISO**	**Number of Cross-listed Stocks**	**Number of Cross-listed Stocks with valid ADR data**
Developed			
Australia	AUS	190	140
Belgium	BEL	26	23
France	FRA	94	80
Germany	DEU	104	86
Ireland	IRL	20	14
Italy	ITA	53	36
Japan	JPN	330	284
Netherlands	NLD	39	29
Singapore	SGP	56	35
Spain	ESP	43	32
Sweden	SWE	61	54
UK	GBR	257	200
Total		**1,273**	**1,013**
Emerging			
Brazil	BRA	98	73
Chile	CHL	15	9
Colombia	COL	13	6
Greece	GRC	18	10
India	IND	2	1
Korea	KOR	19	11
Mexico	MEX	51	37
Russia	RUS	3	3
Total		**219**	**150**

Table 3.2: Summary Statistics for Selected Variables

This table reports average values of stock illiquidity using Amihud's measure of illiquidity (*Ami_illiquidity*) and some selected variables: *Market Return* (Value weighted market return), *Market Volatility*, *Home_EPU*, and *GDP Per Capita* in US$. These are the time-series averages (over the period from the first month in the sample to 2019-12) for 20 countries in the sample. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically. Variable definitions are provided in Appendix Table 3A

Country	*ISO*	*Ami_illiquidity*	*Market Return*	*Market Volatility*	*Home_EPU*	*GDP Per Capita ($)*
Developed						
Australia	AUS	19.006	1.263	1.030	101.736	42330.440
Belgium	BEL	205.964	0.988	0.935	100.477	38420.930
France	FRA	5.007	1.113	0.890	161.136	35437.850
Germany	DEU	91.317	0.986	0.991	130.704	37984.770
Ireland	IRL	11.833	1.555	1.187	118.573	49946.490
Italy	ITA	1.273	0.959	0.926	109.269	30875.060
Japan	JPN	0.714	0.776	1.062	109.187	38228.520
Netherlands	NLD	3.624	1.047	0.956	95.273	43641.780
Singapore	SGP	30.349	1.400	0.826	125.237	41306.100
Spain	ESP	0.781	0.982	1.080	103.450	25919.960
Sweden	SWE	12.849	1.205	1.129	94.550	46532.160
UK	GBR	3.212	0.679	0.683	190.049	38901.140
Emerging						
Brazil	BRA	4.42	1.900	1.544	161.750	7625.620
Chile	CHL	3.049	1.135	0.889	107.675	10273.790
Colombia	COL	0.558	1.515	1.068	102.342	4895.460
Greece	GRC	38.775	1.348	1.353	96.198	20462.370
India	IND	622.447	1.854	0.965	93.996	1094.450
Korea	KOR	1.379	2.004	1.411	134.555	21361.780
Mexico	MEX	13.901	1.127	0.972	86.007	8594.110
Russia	RUS	151.29	4.316	1.941	111.955	7969.710

Table 3.3: Domestic and U.S. EPU, domestic liquidity, and cross-listing (Full Sample)

This table reports the empirical results on a full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.366***	0.406***	0.344***	0.384***			0.343***	0.388***
	(23.743)	(24.838)	(20.537)	(21.799)			(20.517)	(21.623)
Cross_Listed	-4.451***	-2.085***	-4.450***	-2.109***	-4.433***	-3.230***	-3.350***	-2.588***
	(-56.455)	(-5.104)	(-56.449)	(-5.163)	(-56.232)	(-9.118)	(-9.502)	(-6.328)
Home_EPU Cross_Listed*		-0.493***		-0.488***				-0.530***
		(-6.241)		(-6.176)				(-5.854)
US_EPU			0.134***	0.127***	0.291***	0.308***	0.150***	0.117***
			(14.089)	(13.390)	(55.887)	(43.493)	(14.033)	(10.445)
US_EPU Cross_Listed*						-0.250***	-0.229***	0.142*
						(-3.801)	(-3.494)	(1.801)
GDP Per Capita	0.199***	0.192***	0.195***	0.187***	0.193***	0.190***	0.192***	0.188***
	(4.086)	(3.929)	(3.983)	(3.833)	(3.908)	(3.843)	(3.922)	(3.854)
Average Stock Price	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*
	(-1.689)	(-1.689)	(-1.688)	(-1.688)	(-1.673)	(-1.672)	(-1.688)	(-1.688)
Market Volatility	0.369***	0.371***	0.354***	0.356***	0.396***	0.396***	0.354***	0.356***
	(51.480)	(51.699)	(47.816)	(48.150)	(53.493)	(53.538)	(47.885)	(48.112)
Market Return	-0.006***	-0.006***	-0.006***	-0.006***	-0.008***	-0.008***	-0.006***	-0.006***
	(-23.269)	(-22.673)	(-23.254)	(-22.662)	(-29.838)	(-29.810)	(-23.218)	(-22.666)
Constant	-4.973***	-5.082***	-5.439***	-5.521***	-4.594***	-4.642***	-5.481***	-5.502***
	(-10.134)	(-10.349)	(-11.127)	(-11.291)	(-9.275)	(-9.378)	(-11.221)	(-11.261)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,782,641	2,782,641	2,782,641	2,782,641	2,807,315	2,807,315	2,782,641	2,782,641
R-Squared	0.480	0.481	0.480	0.481	0.477	0.477	0.480	0.481

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 3.4 Panel A: Domestic and U.S. EPU, domestic liquidity, and cross-listing (Developed Countries)

This table reports the empirical results on the full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t.* Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Home_EPU	0.377***	0.427***	0.348***	0.398***			0.348***	0.400***
	(17.951)	(18.956)	(15.549)	(16.690)			(15.566)	(16.503)
Cross_Listed	-4.648***	-2.118***	-4.647***	-2.140***	-4.629***	-3.049***	-3.115***	-2.410***
	(-54.961)	(-4.694)	(-54.957)	(-4.742)	(-54.737)	(-7.759)	(-7.956)	(-5.339)
Home_EPU Cross_Listed*		-0.525***		-0.521***				-0.547***
		(-6.055)		(-6.000)				(-5.478)
US_EPU			0.200***	0.195***	0.327***	0.353***	0.226***	0.188***
			(17.846)	(17.374)	(52.058)	(40.172)	(17.779)	(13.986)
US_EPU Cross_Listed*						-0.329***	-0.319***	0.082
						(-4.525)	(-4.402)	(0.974)
GDP Per Capita	1.203***	1.188***	1.218***	1.202***	1.280***	1.279***	1.217***	1.202***
	(15.308)	(15.122)	(15.459)	(15.269)	(16.521)	(16.519)	(15.454)	(15.266)
Average Stock Price	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*
	(-1.756)	(-1.756)	(-1.755)	(-1.755)	(-1.735)	(-1.734)	(-1.754)	(-1.755)
Market Volatility	0.326***	0.325***	0.294***	0.294***	0.376***	0.376***	0.294***	0.294***
	(38.900)	(38.792)	(34.592)	(34.604)	(38.899)	(38.921)	(34.602)	(34.596)
Market Return	-0.007***	-0.007***	-0.007***	-0.007***	-0.008***	-0.008***	-0.007***	-0.007***
	(-21.973)	(-21.731)	(-21.557)	(-21.333)	(-26.110)	(-26.055)	(-21.482)	(-21.382)
Constant	-15.978***	-16.047***	-16.915***	-16.958***	-16.596***	-16.715***	-17.030***	-16.930***
	(-19.617)	(-19.733)	(-20.645)	(-20.732)	(-20.310)	(-20.501)	(-20.832)	(-20.729)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,922,334	1,922,334	1,922,334	1,922,334	1,946,723	1,946,723	1,922,334	1,922,334
R-Squared	0.348	0.349	0.348	0.349	0.345	0.346	0.348	0.349

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 3.4 Panel B: Domestic and U.S. EPU, domestic liquidity and cross-listing (Emerging Countries)

This table reports the empirical results on full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.227***	0.230***	0.196***	0.198***			0.195***	0.196***
	(10.938)	(10.569)	(8.411)	(8.173)			(8.383)	(7.972)
Cross_Listed	-3.302***	-3.035***	-3.304***	-3.100***	-3.306***	-2.602***	-2.840***	-2.781***
	(-15.601)	(-3.157)	(-15.602)	(-3.220)	(-15.595)	(-2.898)	(-3.193)	(-2.644)
Home_EPU Cross_Listed*		-0.057		-0.043				-0.026
		(-0.300)		(-0.229)				(-0.128)
US_EPU			0.147***	0.146***	0.265***	0.270***	0.151***	0.150***
			(10.014)	(10.050)	(30.909)	(24.784)	(9.285)	(8.915)
US_EPU Cross_Listed*						-0.147	-0.097	-0.083
						(-0.846)	(-0.561)	(-0.429)
GDP Per Capita	-1.072***	-1.071***	-1.081***	-1.080***	-1.116***	-1.119***	-1.082***	-1.081***
	(-8.349)	(-8.347)	(-8.398)	(-8.398)	(-8.758)	(-8.772)	(-8.400)	(-8.399)
Average Stock Price	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-4.340)	(-4.339)	(-4.342)	(-4.342)	(-4.359)	(-4.359)	(-4.342)	(-4.342)
Market Volatility	0.359***	0.359***	0.345***	0.345***	0.349***	0.349***	0.345***	0.345***
	(38.479)	(38.504)	(37.554)	(37.624)	(38.637)	(38.753)	(37.673)	(37.638)
Market Return	-0.007***	-0.007***	-0.007***	-0.007***	-0.008***	-0.008***	-0.007***	-0.007***
	(-19.616)	(-19.680)	(-19.770)	(-19.850)	(-22.268)	(-22.338)	(-19.794)	(-19.834)
Constant	7.884***	7.859***	7.427***	7.411***	8.088***	8.085***	7.428***	7.418***
	(6.710)	(6.698)	(6.418)	(6.410)	(7.129)	(7.132)	(6.421)	(6.414)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	860,307	860,307	860,307	860,307	860,592	860,592	860,307	860,307
R-Squared	0.638	0.638	0.638	0.638	0.637	0.637	0.638	0.638

t-stat in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Table 3.5 Panel A: Domestic and U.S. EPU, domestic liquidity and cross-listing (Common Law Countries)

This table reports the empirical results on full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.213***	0.266***	0.159***	0.213***			0.159***	0.219***
	(11.697)	(12.906)	(7.927)	(9.521)			(7.941)	(9.419)
Cross_Listed	-4.659***	-0.873	-4.659***	-0.891	-4.628***	-1.531**	-1.711**	-1.919***
	(-27.195)	(-1.160)	(-27.191)	(-1.184)	(-27.107)	(-2.098)	(-2.311)	(-2.663)
Home_EPU Cross_Listed*		-0.770***		-0.766***				-0.854***
		(-5.881)		(-5.852)				(-5.179)
US_EPU			0.259***	0.253***	0.342***	0.381***	0.296***	0.234***
			(20.009)	(19.473)	(36.573)	(30.040)	(19.580)	(13.250)
US_EPU Cross_Listed*						-0.645***	-0.614***	0.304
						(-4.807)	(-4.513)	(1.628)
GDP Per Capita	-0.664***	-0.705***	-0.744***	-0.783***	-0.943***	-0.961***	-0.760***	-0.780***
	(-7.377)	(-7.868)	(-8.245)	(-8.713)	(-10.397)	(-10.591)	(-8.433)	(-8.664)
Average Stock Price	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.745)	(-3.740)	(-3.752)	(-3.747)	(-3.746)	(-3.744)	(-3.750)	(-3.748)
Market Volatility	0.332***	0.336***	0.299***	0.304***	0.325***	0.327***	0.302***	0.303***
	(25.111)	(25.442)	(22.242)	(22.608)	(23.950)	(24.190)	(22.528)	(22.632)
Market Return	-0.007***	-0.006***	-0.007***	-0.007***	-0.008***	-0.008***	-0.007***	-0.007***
	(-12.892)	(-12.081)	(-13.636)	(-12.806)	(-16.615)	(-16.388)	(-13.363)	(-12.962)
Constant	6.020***	6.171***	5.846***	6.001***	8.071***	8.056***	5.824***	6.029***
	(6.900)	(7.080)	(6.707)	(6.892)	(9.255)	(9.237)	(6.679)	(6.931)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	975,835	975,835	975,835	975,835	994,351	994,351	975,835	975,835
R-Squared	0.458	0.460	0.459	0.460	0.456	0.456	0.459	0.460

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 3.5 Panel B: Domestic and U.S. EPU, domestic liquidity and cross-listing (Civil Law Countries)

This table reports the empirical results on full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.337***	0.355***	0.306***	0.324***			0.305***	0.325***
	(17.709)	(17.708)	(14.607)	(14.811)			(14.585)	(14.610)
Cross_Listed	-4.358***	-3.272***	-4.358***	-3.306***	-4.354***	-3.774***	-3.923***	-3.403***
	(-53.212)	(-5.959)	(-53.210)	(-6.025)	(-53.189)	(-10.029)	(-10.527)	(-6.643)
*Home_EPU**		-0.229**		-0.222**				-0.232*
Cross_Listed		(-2.026)		(-1.964)				(-1.814)
US_EPU			0.147***	0.144***	0.280***	0.289***	0.153***	0.141***
			(13.461)	(13.333)	(49.632)	(36.424)	(12.572)	(11.234)
US_EPU Cross_Listed*						-0.121*	-0.090	0.030
						(-1.703)	(-1.286)	(0.346)
GDP Per Capita	0.374***	0.370***	0.381***	0.377***	0.541***	0.541***	0.381***	0.376***
	(5.654)	(5.579)	(5.756)	(5.681)	(8.276)	(8.268)	(5.761)	(5.680)
Average Stock Price	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*
	(-1.755)	(-1.755)	(-1.754)	(-1.754)	(-1.744)	(-1.744)	(-1.754)	(-1.754)
Market Volatility	0.372***	0.372***	0.356***	0.356***	0.389***	0.389***	0.356***	0.356***
	(46.325)	(46.311)	(43.827)	(43.891)	(48.992)	(48.900)	(43.824)	(43.852)
Market Return	-0.007***	-0.007***	-0.007***	-0.007***	-0.008***	-0.008***	-0.007***	-0.007***
	(-26.044)	(-26.024)	(-25.981)	(-25.960)	(-29.591)	(-29.626)	(-25.999)	(-25.949)
Constant	-7.698***	-7.739***	-8.302***	-8.329***	-9.183***	-9.218***	-8.331***	-8.321***
	(-11.403)	(-11.477)	(-12.313)	(-12.363)	(-13.663)	(-13.749)	(-12.390)	(-12.368)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,806,806	1,806,806	1,806,806	1,806,806	1,812,964	1,812,964	1,806,806	1,806,806
R-Squared	0.332	0.332	0.333	0.333	0.331	0.331	0.333	0.333

t-stat in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Table 3.6 Panel A: Domestic and U.S. EPU, domestic liquidity and cross-listing (Weak Governance Countries)

This table reports the empirical results on full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.181***	0.190***	0.145***	0.155***			0.143***	0.152***
	(10.013)	(9.458)	(7.143)	(6.891)			(7.087)	(6.676)
Cross_Listed	-3.960***	-3.113***	-3.961***	-3.183***	-3.959***	-3.005***	-3.171***	-2.813***
	(-23.063)	(-3.221)	(-23.061)	(-3.288)	(-23.013)	(-3.838)	(-4.073)	(-2.786)
Home_EPU Cross_Listed*		-0.180		-0.165				-0.144
		(-0.933)		(-0.855)				(-0.701)
US_EPU			0.160***	0.157***	0.244***	0.252***	0.168***	0.162***
			(12.096)	(11.692)	(29.463)	(23.332)	(11.292)	(10.193)
US_EPU Cross_Listed*						-0.198	-0.164	-0.097
						(-1.323)	(-1.104)	(-0.593)
GDP Per Capita	-1.257***	-1.256***	-1.267***	-1.266***	-1.276***	-1.279***	-1.269***	-1.267***
	(-11.837)	(-11.825)	(-11.903)	(-11.890)	(-12.019)	(-12.040)	(-11.915)	(-11.889)
Average Stock Price	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-3.629)	(-3.625)	(-3.622)	(-3.619)	(-3.600)	(-3.601)	(-3.623)	(-3.620)
Market Volatility	0.446***	0.447***	0.428***	0.429***	0.433***	0.433***	0.428***	0.429***
	(48.080)	(48.222)	(46.436)	(46.613)	(47.888)	(47.922)	(46.517)	(46.486)
Market Return	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***
	(-17.976)	(-17.829)	(-18.225)	(-18.068)	(-20.383)	(-20.379)	(-18.215)	(-18.069)
Constant	9.678***	9.624***	9.190***	9.151***	9.546***	9.533***	9.184***	9.152***
	(9.789)	(9.722)	(9.410)	(9.359)	(9.887)	(9.881)	(9.410)	(9.362)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	855,010	855,010	855,010	855,010	855,295	855,295	855,010	855,010
R-Squared	0.635	0.635	0.635	0.635	0.635	0.635	0.635	0.635

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 3.6 Panel B: Domestic and U.S. EPU, domestic liquidity and cross-listing (Strong Governance Countries)

This table reports the empirical results on full sample of non-cross-listed stocks, using panel regression for Models 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	2.431*	2.473*	1.709	1.763	2.544*	2.447*	1.619	1.794
	(1.718)	(1.750)	(1.210)	(1.249)	(1.802)	(1.734)	(1.147)	(1.274)
Home_EPU	0.118***	0.158***	0.037	0.077***			0.036	0.080***
	(5.160)	(6.120)	(1.423)	(2.696)			(1.408)	(2.668)
Cross_Listed	-4.494***	-2.573***	-4.494***	-2.626***	-4.483***	-3.116***	-3.182***	-2.907***
	(-31.991)	(-4.004)	(-31.991)	(-4.086)	(-31.933)	(-4.904)	(-4.990)	(-4.404)
Home_EPU Cross_Listed*		-0.398***		-0.387***				-0.412***
		(-3.431)		(-3.339)				(-2.863)
US_EPU			0.396***	0.389***	0.407***	0.431***	0.420***	0.382***
			(22.856)	(22.354)	(39.474)	(28.674)	(20.671)	(16.036)
US_EPU Cross_Listed*						-0.285**	-0.274**	0.083
						(-2.367)	(-2.265)	(0.502)
GDP Per Capita	-0.326**	-0.347***	-0.392***	-0.412***	-0.462***	-0.464***	-0.394***	-0.413***
	(-2.471)	(-2.641)	(-2.972)	(-3.129)	(-3.487)	(-3.500)	(-2.987)	(-3.136)
Average Stock Price	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.584)	(-3.581)	(-3.595)	(-3.592)	(-3.626)	(-3.625)	(-3.594)	(-3.592)
Market Volatility	0.354***	0.353***	0.287***	0.287***	0.316***	0.316***	0.287***	0.287***
	(30.523)	(30.411)	(24.251)	(24.271)	(25.438)	(25.380)	(24.210)	(24.235)
Market Return	-0.005***	-0.005***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***
	(-10.375)	(-10.226)	(-11.755)	(-11.583)	(-12.687)	(-12.670)	(-11.731)	(-11.596)
Constant	2.431*	2.473*	1.709	1.763	2.544*	2.447*	1.619	1.794
	(1.718)	(1.750)	(1.210)	(1.249)	(1.802)	(1.734)	(1.147)	(1.274)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	814,634	814,634	814,634	814,634	825,386	825,386	814,634	814,634
R-Squared	0.248	0.249	0.249	0.249	0.247	0.247	0.249	0.250

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 3.7: Domestic and U.S. EPU, domestic liquidity, and cross-listing (Matched Sample)

This table reports the empirical results on a matched sample of non-cross-listed stocks, using panel regression for Model 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of the daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value-weighted daily returns for month *t*, and *Market Return* is the daily value-weighted return compounded for month *t.* Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.475***	0.753***	0.465***	0.742***			0.462***	0.747***
	(8.443)	(8.093)	(7.831)	(7.815)			(7.812)	(7.280)
Cross_Listed	-2.139***	-0.022	-2.139***	-0.023	-2.136***	-0.444	-0.479	-0.034
	(-20.514)	(-0.039)	(-20.511)	(-0.040)	(-20.410)	(-0.901)	(-0.984)	(-0.061)
Home_EPU Cross_Listed*		-0.442***		-0.442***				-0.415***
		(-3.874)		(-3.872)				(-3.183)
US_EPU			0.081***	0.080***	0.235***	0.458***	0.302***	0.088
			(2.866)	(2.811)	(15.143)	(7.144)	(4.475)	(1.088)
US_EPU Cross_Listed*						-0.352***	-0.346***	-0.028
						(-3.644)	(-3.617)	(-0.241)
GDP Per Capita	0.373	0.367	0.374	0.368	0.342	0.341	0.374	0.340
	(1.423)	(1.399)	(1.425)	(1.401)	(1.317)	(1.316)	(1.427)	(1.322)
Average Stock Price	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.581)	(-3.511)	(-3.585)	(-3.514)	(-3.752)	(-3.726)	(-3.560)	(-3.456)
Market Volatility	0.335***	0.334***	0.323***	0.323***	0.442***	0.441***	0.323***	0.331***
	(13.451)	(13.458)	(12.828)	(12.845)	(16.727)	(16.693)	(12.823)	(13.312)
Market Return	-0.003***	-0.003***	-0.003***	-0.003***	-0.004***	-0.004***	-0.003***	-0.002**
	(-2.786)	(-2.769)	(-2.774)	(-2.757)	(-3.812)	(-3.805)	(-2.770)	(-2.414)
Constant	-9.945***	-11.204***	-10.283***	-11.535***	-8.555***	-9.618***	-11.326***	-11.273***
	(-3.652)	(-4.131)	(-3.774)	(-4.250)	(-3.159)	(-3.585)	(-4.200)	(-4.262)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232,783	232,783	232,783	232,783	233,837	233,837	232,783	237,950
R-Squared	0.401	0.402	0.401	0.402	0.400	0.400	0.401	0.402

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 3.8: Domestic and U.S. EPU, domestic liquidity, and cross-listing (Additional macro controls)

This table reports the empirical results on full sample of non-cross-listed stocks, using panel regression for Model 1 through 4. Amihud's illiquidity measure (*Ami_illiquidity*) is the dependent variable. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. US_EPU_t is the natural log of the U.S. economic policy uncertainty index (EPU index) in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. Controls represent different control variables that include *Average Stock Price* calculated as the simple average of daily closing price of stock j in month t, *GDP per Capita* is the natural log of GDP per capita in US$., *Market Volatility* is the standard deviation of value weighted daily returns for month *t*, and *Market Return* is the daily value weighted return compounded for month *t*. Column (8) represents results including both *Home_EPU* and *US_EPU* and their interaction terms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home_EPU	0.286***	0.313***	0.228***	0.256***			0.224***	0.249***
	(18.862)	(18.804)	(13.363)	(13.881)			(13.211)	(13.035)
Cross_Listed	-3.968***	-2.263***	-3.969***	-2.308***	-3.954***	-2.206***	-2.357***	-1.866***
	(-36.868)	(-4.049)	(-36.867)	(-4.126)	(-36.732)	(-5.249)	(-5.589)	(-3.607)
Home_EPU Cross_Listed*		-0.367***		-0.357***				-0.297**
		(-3.301)		(-3.212)				(-2.204)
US_EPU			0.201***	0.196***	0.325***	0.349***	0.225***	0.207***
			(21.964)	(21.559)	(49.803)	(39.193)	(20.752)	(17.332)
US_EPU Cross_Listed*						-0.367***	-0.338***	-0.151
						(-4.459)	(-4.098)	(-1.393)
GDP Growth	-0.083***	-0.083***	-0.084***	-0.084***	-0.079***	-0.079***	-0.084***	-0.084***
	(-21.940)	(-21.961)	(-22.138)	(-22.155)	(-22.359)	(-22.316)	(-22.126)	(-22.139)
Inflation	-0.004	-0.002	-0.001	0.001	0.022***	0.022***	-0.001	0.000
	(-0.500)	(-0.297)	(-0.106)	(0.087)	(2.847)	(2.845)	(-0.101)	(0.057)
Interest Rate Spread	-0.039***	-0.040***	-0.039***	-0.039***	-0.028**	-0.029**	-0.039***	-0.039***
	(-2.980)	(-2.997)	(-2.925)	(-2.943)	(-2.118)	(-2.164)	(-2.967)	(-2.959)
GDP Per Capita	0.402***	0.402***	0.433***	0.433***	0.666***	0.667***	0.436***	0.434***
	(5.451)	(5.458)	(5.887)	(5.882)	(9.150)	(9.165)	(5.927)	(5.901)
Average Stock Price	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-4.872)	(-4.870)	(-4.873)	(-4.871)	(-4.874)	(-4.873)	(-4.872)	(-4.871)
Market Volatility	0.339***	0.339***	0.318***	0.318***	0.323***	0.323***	0.318***	0.318***
	(39.672)	(39.644)	(37.198)	(37.240)	(40.082)	(39.984)	(37.178)	(37.192)
Market Return	-0.007***	-0.007***	-0.007***	-0.007***	-0.008***	-0.008***	-0.007***	-0.007***
	(-22.932)	(-22.727)	(-23.186)	(-22.983)	(-27.164)	(-27.154)	(-23.179)	(-22.979)
Constant	-7.230***	-7.364***	-8.211***	-8.319***	-10.215***	-10.333***	-8.331***	-8.355***
	(-9.500)	(-9.711)	(-10.880)	(-11.054)	(-13.659)	(-13.867)	(-11.084)	(-11.119)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,595,277	1,595,277	1,595,277	1,595,277	1,614,078	1,614,078	1,595,277	1,595,277
R-Squared	0.318	0.318	0.318	0.318	0.318	0.318	0.318	0.318

t-stat in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Table 3.9: Baseline Regression Model using Different Liquidity Measures

This table presents the empirical results for Model 1 using stock liquidity as the dependent variable. I estimate the following baseline model: $LIQ_{j,i,t} = \alpha + \beta_0 Home\_EPU_{i,t} + \beta_1 Cross\_Listed_{j,i,t} + \beta_2 Home\_EPU_{i,t} * Cross\_Listed_{j,i,t} + \gamma Controls_{i,t} + \epsilon_{i,t}$, where $LIQ_{j,i,t}$ is stock illiquidity (liquidity) using four (except *Ami_illiquidity*) different measures of illiquidity (liquidity) for stock *j*, country *i* in month *t*. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. $Cross\_Listed_{j,i,t}$ is a dummy variable which equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise. *Controls* represent different control variables that include *Average Monthly Price* calculated as the simple average of the daily closing price of stock *j* in month *t*, *GDP per Capita*, *Market Volatility*, and *Market Return.*

Variables	***PQ Spread***		***CHL Spread***		***H-L Spread***		***Modified. LIQ***	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Home_EPU	0.053***	0.098***	0.057***	0.062***	0.066***	0.072***	-0.026***	-0.027***
	(8.177)	(14.228)	(14.919)	(14.941)	(14.266)	(14.708)	(-13.464)	(-13.483)
Cross_Listed	-1.434***	1.086***	-0.362***	-0.148**	-0.235***	0.043	0.015***	-0.055***
	(-48.680)	(6.932)	(-31.613)	(-2.228)	(-19.913)	(0.605)	(7.649)	(-5.160)
Home_EPU * *Cross_Listed*		-0.524***		-0.044***		-0.058***		0.014***
		(-15.998)		(-3.391)		(-4.042)		(6.856)
GDP Per Capita	0.198***	0.191***	0.046***	0.045***	-0.166***	-0.167***	0.303***	0.303***
	(9.887)	(9.613)	(3.793)	(3.693)	(-11.966)	(-12.077)	(20.592)	(20.601)
Average Stock Price	-0.000*	-0.000*	-0.000**	-0.000**	0.000**	0.000**	0.000	0.000
	(-1.944)	(-1.941)	(-2.006)	(-2.006)	(2.267)	(2.323)	(0.705)	(0.701)
Market Volatility	0.190***	0.191***	0.246***	0.246***	0.167***	0.168***	0.010***	0.010***
	(70.388)	(70.817)	(133.791)	(133.914)	(86.853)	(86.913)	(7.601)	(7.579)
Market Return	-0.001***	-0.001***	-0.000**	-0.000*	0.001***	0.001***	0.001***	0.001***
	(-7.637)	(-5.864)	(-2.036)	(-1.800)	(14.764)	(15.039)	(11.875)	(11.821)
Constant	-1.925***	-2.066***	-5.409***	-5.418***	-3.495***	-3.507***	-3.012***	-3.009***
	(-9.573)	(-10.308)	(-44.566)	(-44.635)	(-25.747)	(-25.834)	(-20.748)	(-20.733)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,493,498	2,493,498	1,947,275	1,947,275	1,946,440	1,946,440	2,782,641	2,782,641
R-Squared	0.483	0.486	0.250	0.250	0.278	0.278	0.091	0.091

t-stat in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Figure 3.1: Figure showing the number of cross-listed stocks by country (Developed Countries)

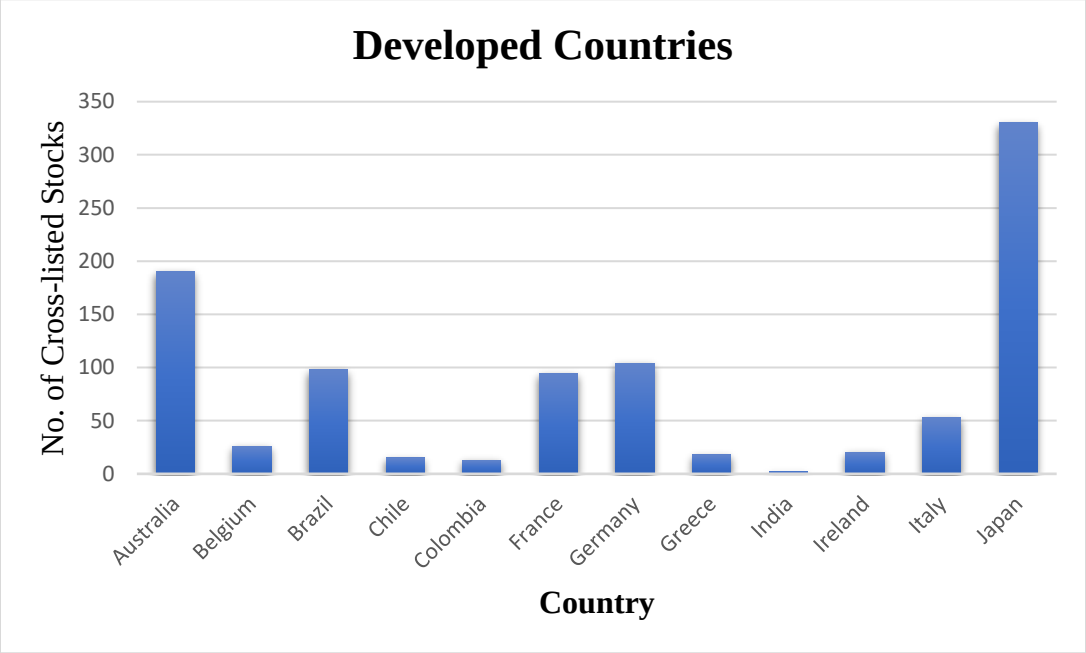


Figure 3.2: Figure showing the number of cross-listed stocks by country (Emerging Countries)

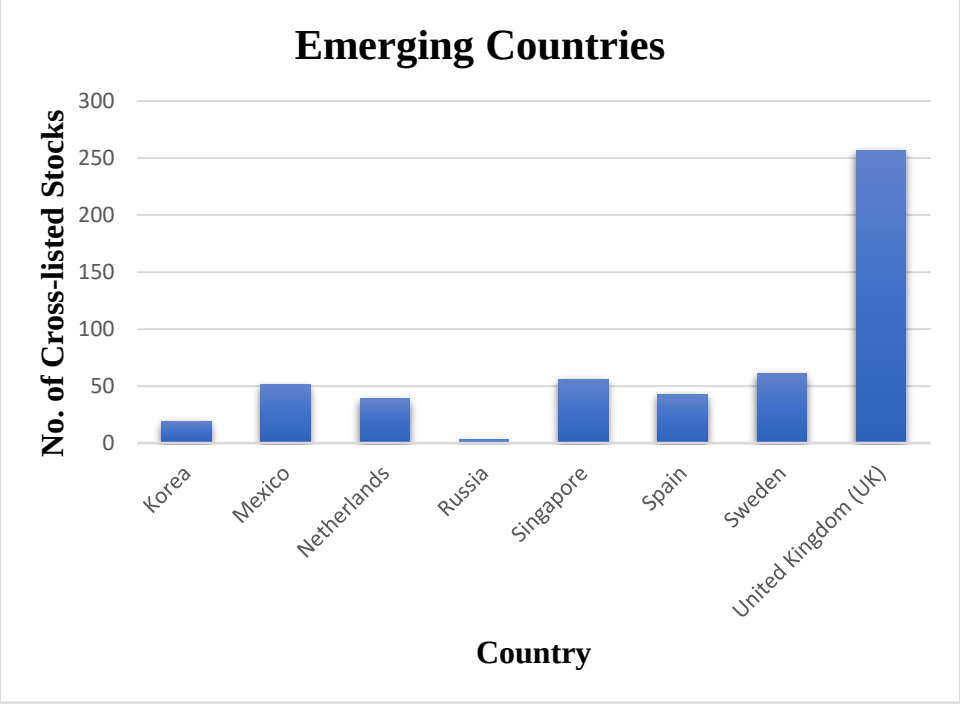
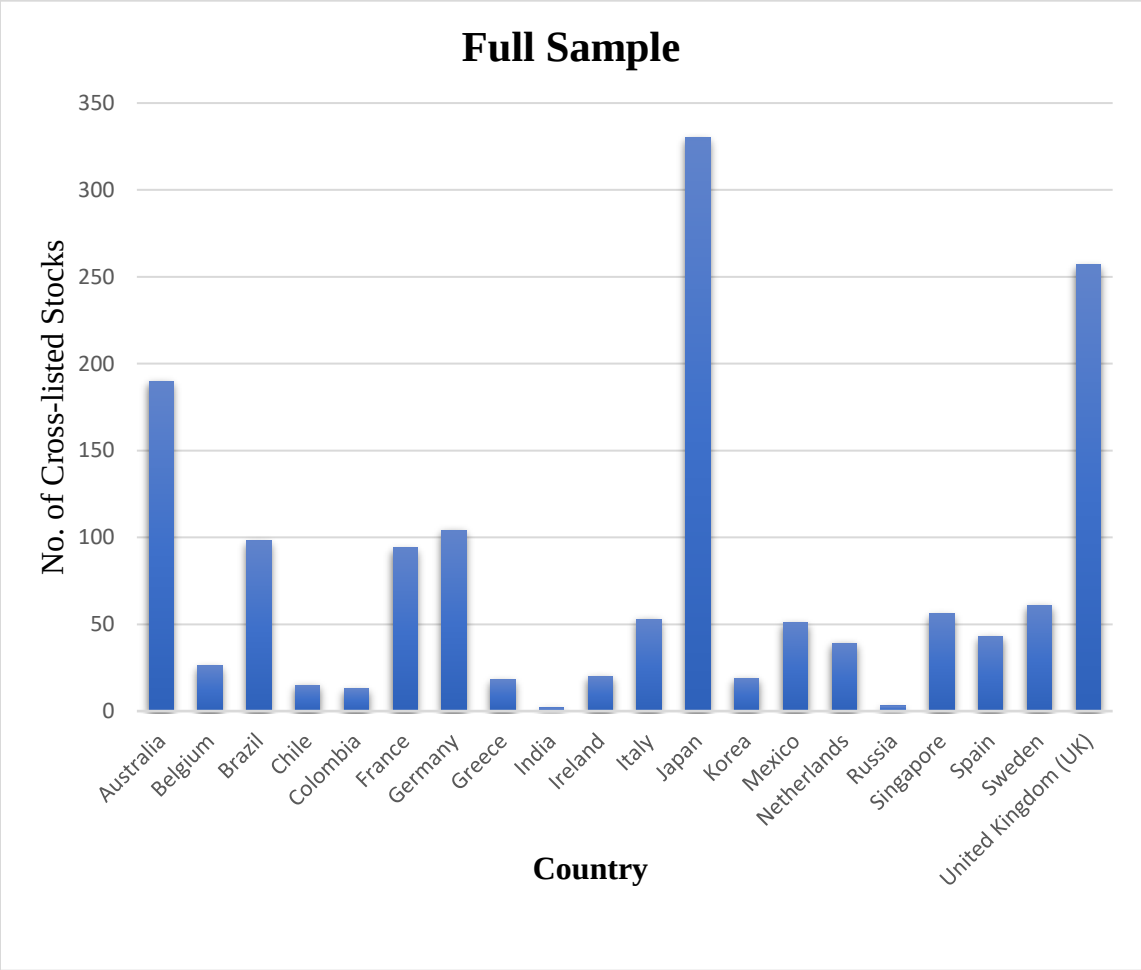


Figure 3.3: Figure showing the number of cross-listed stocks by country (Full Sample)



APPENDIX

Appendix Table 3A: Descriptions of Variables

This table defines all the variables used in the paper, along with their data source.

Home_EPU	Natural log of Economic Policy Uncertainty Index by Baker et al. (2016) (EPU index)	https://www.policyuncertainty.com/all_country_data.html
US_EPU	Natural log of the U.S. Economic Policy Uncertainty Index by Baker et al. (2016) (EPU index)	https://www.policyuncertainty.com/all_country_data.html
Ami Illiquidity	Amihud's illiquidity measure calculated following Amihud (2002)	Own computations using data from Datastream
PQ Spread	Percent quoted spread calculated as Ask Price -Bid Price /((Ask Price+ Bid Price)/2) *100	Own computations using data from Datastream
CHL Spread	Closing-High and Low spread measure of illiquidity calculated following Abdi and Ranaldo (2017)	Own computations using data from Datastream
H_L Spread	High-Low Spread measure of illiquidity calculated following Corwin and Schultz (2012)	Own computations using data from Datastream
Modified LIQ	The modified measure of Liquidity calculated following Karolyi (2012)	Own computations using data from Datastream
Cross_Listed	A dummy variable equals 1 if a stock j, from country i in month t is cross-listed in the U.S. and zero otherwise.	Own computations
Average Stock Price	The average stock price for the month	Own computations using data from Datastream

Market Volatility	The volatility of value-weighted market returns calculated as the standard deviation of daily stock returns in month t	Own computations using data from Datastream
Market Return	Value-weighted market returns are calculated based on daily returns and compounded over the month.	Own computations using data from Datastream
GDP Per Capita	Natural log of GDP per capita in US$	WDI Indicators of World Bank
GDP Growth	GDP growth (annual %)	WDI Indicators of World Bank
Inflation	Inflation, GDP deflator (annual %)	WDI Indicators of World Bank
Interest rate spread	Lending rate minus deposit rate (%)	WDI Indicators of World Bank

CHAPTER 4

Economic policy uncertainty and stock-market liquidity: Do country characteristics matter?

Abstract

The development of financial markets is critical for economic growth. A developed financial market reflects transparency, efficiency, and liquidity. An uncertain environment is a barrier to financial development. Theoretical and empirical research on uncertainty suggests detrimental effects on corporate decision-making and characteristics of financial markets. Using a broad sample of twenty-four countries spanning over twenty-three years, I investigate the impact of economic policy uncertainty (EPU) on stock-market liquidity. Most of the prior studies focus on the U.S. market. The use of an international sample allows me to investigate country-level cross-sectional variations. Consistent with the existing literature, I find that economic policy uncertainty reduces market liquidity. The impact is stronger for countries with funding constraints and having weak governance. Financial development helps to weaken the relationship between EPU and market liquidity. Amid heightened economic policy uncertainty, political stability does not help; rather, its impact is more pronounced in politically stable countries due to the unpredictability of changes. My study has important implications for policymakers. It guides the policymakers to ensure stable economic policies along with strong governance mechanisms and transparency.

JEL Classification Codes: *G10, G15, G18*

Keywords: *Market liquidity, Economic policy uncertainty, Information asymmetry, Governance*

4.1 Introduction

The importance of financial markets lies in the fact that financial markets channelize the funds most efficiently, thereby paving the way for economic development. Financial markets facilitate price discovery and provide various services to ensure the process of capital formation. With such vital roles, financial markets become the key to a country's long-term economic growth (Atje and Jovanovic, 1993; Pagano, 1993; Rajan and Zingales, 1998; Levine and Zervos, 1998). Historically, the literature in economics emphasized the role of banks in economic growth in channelizing funding to projects/entrepreneurs with a high probability of success.[16] In the later years, McKinnon (2010) and Shaw (1973) spotlight and provide evidence of the role of financial markets' development in economic growth. Levine (1997) argues that the development of financial markets contributes to current economic growth, but it is also a good predictor of future economic growth. Pagano (1993) argues that financial markets improve economic development through the channels of saving and investment.

The ability of financial markets to perform the functions like price discovery, providing transparency to the investment process, and ensuring the liquidity of financial assets make them crucial in channelizing the scarce resources to their most efficient use. The liquidity of financial assets is of particular importance. It ensures that the investors do not have to carry the risk indefinitely, and the funds will flow to the most productive assets.

Policymakers are always concerned about market liquidity as it ultimately leads to economic development. The concern about market liquidity becomes severe in peculiar times like financial crisis and uncertain times when all the stakeholders are skeptical about the outcomes of their

[16] See Bagehot (1973) and Schumpeter (1982) for the role of banks in economic growth.

decisions. It raises a natural question of whether uncertainty regarding policy decisions of the government affects market liquidity.

The literature on the impact of economic policy uncertainty (EPU) majorly focuses on different aspects of corporate decision-making such as mergers and acquisitions (Bonaime et al., 2018; Nguyen and Phan, 2017; Duchin and Schmidt, 2013), cash holdings (Hankins et al., 2020; Duong et al., 2020; Phan et al., 2019), investment policy (Gulen and Ion, 2016; Novy-Marx, 2007; Dixit et al., 1994; Ingersoll and Ross, 1992; Abel, 1983; Bernanke, 1983; McDonald and Siegel, 1986), capital structure policy (Zhang et al., 2015; Li and Qiu, 2021), innovation (Bhattacharya et al., 2017; Xu, 2020), and payout policy (Attig et al., 2021; Tran, 2020), etc. However, the literature examining the impact of EPU on characteristics of financial markets, particularly market liquidity, is relatively sparse with few exceptions, including Zhang et al. (2021); Dash et al. (2019); Rehse et al. (2019); Ma et al. (2019); Duong et al. (2018); Chung and Chuwonganant (2014).

In this study, I examine the central research question: Does EPU affect market liquidity across countries? To answer the research question, I use a sample of 24 countries over a long horizon of 23 years spanning from 1997 to 2019[17]. The existing literature investigating the impact of EPU on market liquidity is majorly restricted to the U.S. market or any one of the emerging markets except Ma et al. (2019) and Dash et al. (2019) that use a cross-country sample. My study differs from Ma et al. (2019) as I examine the impact of EPU using EPU index as opposed to Ma et al. (2019) that focuses on investors' risk perception, measured using the VIX index. The investors' risk perception might be due to the factors like economic, political, or natural. Some of

[17] I use the economic policy uncertainty index (EPU index) by Baker, Bloom and Davis, 2016 to capture economic policy uncertainty. This index is available for only 26 countries and most of them start from 1997. I drop China and Hongkong from my sample due to data concerns. That is why, my sample include 24 countries over 23 years.

such factors are even out of the control of policymakers. Dash et al. (2019) include G-7 countries in the sample, whereas my sample includes both developed and emerging countries. G-7 countries have less variation between them, whereas I use a broad sample that allows me to study the country-level factors that might affect the uncertainty-liquidity relationship.

I fill the gap in the literature by providing broad international evidence on the relationship between economic policy uncertainty and market liquidity across countries. Providing an international evidence is important for two reasons: first, it allows for country-level cross-sectional tests due to variations across countries[18] ; second, the international scope allows to investigate the impact of different economic, political, and legal regulatory environments on liquidity. The extended sample period of twenty-three years (1997-2019) enables me to assess the impact during different phases of the economy. Additionally, I contribute to the literature on commonality in liquidity by showing EPU as a source of commonality in liquidity.

In this study, I predict a negative impact of EPU on market liquidity. Heightened economic policy uncertainty leads to an increased level of information asymmetry. Theoretical models in the academic literature predict a decrease in market liquidity with an increase in information asymmetry. Glosten and Milgrom (1985) and Kyle (1985), in their theoretical models, show that an increased level of information asymmetry in the market increases the risk of adverse selection.

[18] Liquidity as measured by cost of trading is consistently low in Paris Bourse while consistently high in South Korea (Willoughby, 1998). The variations in one-way equity trading cost ranges from as high as 198 basis points in Korea to as low as 30 basis points in France (Domowitz, Glen, and Madhavan, 2001). According to a report on '*Global Equity Trading Cost Analysis'* by McKinley Capital Management, LLC, the spread is persistently tight in developed market compared to the emerging markets. https://www.mckinleycapital.com/global-equity-trading-cost-analysis/

Therefore, liquidity providers or market makers demand higher compensation in terms of bid-ask spread for the additional adverse selection risk.

Consistent with the prediction, I find a statistically and economically significant detrimental impact of EPU on market liquidity across countries. I use news based economic policy uncertainty index by Baker et al. (2016) (henceforth EPU index) to measure economic policy uncertainty. One of the potential issues with using a news-based EPU index is that it might inadvertently capture the impact of other macroeconomic uncertainty, which might not be attributed to economic policy uncertainty. The results, therefore, might be driven by omitted variables. To address this issue, I control for other macroeconomic uncertainty measures following Bloom (2009) and Duong et al. (2020) and find consistent results.

Another potential concern with my analysis is the confounding impact of the U.S. economic policy uncertainty as one might argue that the U.S. economic policy uncertainty affects the economic policy uncertainty of other countries, so the analysis might capture the impact of the U.S. economic policy uncertainty. To address this concern, I create a subsample except for the U.S. and use the U.S. economic policy uncertainty as a control variable. The results hold even after controlling for the U.S. economic policy uncertainty, suggesting that the impact is immune to U.S. EPU shocks. The results are consistent using different measures of liquidity.

To analyze the impact of different country characteristics in shaping the EPU-liquidity relationship, I run additional country-level cross-sectional tests. I examine the country-level cross-sectional differences in the impact of EPU on market liquidity based on market integration, governance, financial development, and funding constraints.

A developed financial market has a better information environment and more sophisticated investors who might overlook the temporary uncertainties and less affected by market sentiments.

Such markets should have the weak impact of EPU on stock market liquidity. Using three measures of financial market development, I find consistent results.

A more integrated country to the world market may experience a high level of local trading and show high liquidity (Bekaert et al., 2002; De La Torre, Gozzi, and Schmukler, 2007). I, therefore, predict that the impact of domestic EPU should be less severe in a country with an integrated market with the rest of the world. Using trade openness as a proxy for market integration, I find that contrary to the prediction, trade openness exacerbates the negative impact of EPU on market liquidity.

Conventional wisdom says that funding constraints, through increased margin requirements or increased interest rates, should negatively affect market liquidity, whereas the literature provides mixed evidence. I, therefore, test the role of funding constraints in shaping the uncertainty-liquidity relationship. Consistent with conventional wisdom, I find that a high level of short-term interest rates makes borrowing costly and leveraged trading, which reduces market liquidity. As measured by short-term interest rates, funding constraint worsens the detrimental impact of economic policy uncertainty on stock market liquidity.

Additionally, I test the role of a country's governance in mitigating the negative impact of EPU on market liquidity and find that during uncertain times government effectiveness helps. However, political stability further amplifies the negative impact of EPU on stock market liquidity due to unexpected policy changes.

The rest of the paper is organized as follows. I present the literature review and hypotheses development in section 4.2. Section 4.3 presents data and methodology; empirical results are presented in section 4.4, and section 4.5 concludes.

4.2 Literature Review and Hypotheses Development

The theoretical (Easley and O'Hara, 2010; Ozsoylev and Werner, 2011; Routledge and Zin, 2009) and empirical literature literature (Zhang et al., 2021; Rehse et al., 2019; Dash et al., 2019; Ma et al., 2019; Debata and Mahakud, 2018; Duong et al., 2018; Chung and Chuwonganant, 2014) on uncertainty and liquidity suggests an adverse impact of economic policy uncertainty on stock market liquidity. In the first essay, I examine the impact of EPU on liquidity at firm level. In this essay I examine the impact of economic policy uncertainty on stock market liquidity at country level. I fill the gap in the literature by providing multi-country evidence of the EPU-liquidity relationship at the country level and analyzing the role of country characteristics (market segmentation, funding constraint, information asymmetry, and governance) in shaping the EPU-liquidity relationship.

4.2.1 Financial Development and Economic Policy Uncertainty

A developed financial market is the indicator of more trading activity, presence of more sophisticated investors, and a better information environment. Copeland & Galai (1983) and Glosten & Milgrom (1985) argue that dealers widen the bid-ask spread to compensate for any expected loss caused due to trade with informed traders when faced with information asymmetry. Financial development enhances the ability of a financial system to absorb policy-related shocks and promotes risk-sharing by reducing information asymmetry and financial constraints (Bernanke et al., 1999; Svirydzenka, 2016). Therefore, a developed financial market with a better information environment should help to reduce the impact of information asymmetry caused by economic policy uncertainty on stock market liquidity. Levine and Zervos (1996) show that stock market development is positively related to economic growth. Therefore, countries with high economic growth levels should have developed financial markets, and a developed financial market is expected to have a low level of information asymmetry.

I use different proxies to capture the level of financial development. I use *GDP growth* as a proxy for economic growth. Since Amihud's measure is for illiquidity, I expect a negative sign on *GDP growth.* Financial development encompasses various dimensions, including financial institutions, markets, and their access and efficiency. To measure financial development, one needs to consider all these indicators. I, therefore, use the *Financial Development Index* developed by Svirydzenka (2016) to capture the financial development of a country. Among different financial development indicators, the efficiency of the financial system is most critical (Čihák et al., 2012; Aizenman et al., 2015). Financial efficiency refers to the ability of the financial system to improve the level of activity of the capital market and provide financial services at low cost to ensure the most efficient allocation of resources. An inefficient financial system may defeat the whole purpose of financial development. Therefore, I use *Financial Efficiency Index* as the third proxy for financial development. A high score on the Financial market development index and Financial market efficiency index reflects financially developed markets.

Using three proxies of financial development, I predict that the high level of financial development should help combat the detrimental impact of economic policy uncertainty on stock market liquidity. I, therefore, propose the following hypothesis:

$H_0$2: Financial development does not affect the economic policy uncertainty-liquidity relationship.

H_a2: Financial development helps combat the negative impact of economic policy uncertainty on stock market liquidity.

4.2.2 Market Integration and Economic Policy Uncertainty

A country whose market is integrated (less segmented) with the world market experience a higher level of local trading activity and hence high liquidity (Bekaert et al., 2002; De La Torre

et al., 2007). Domowitz et al. (1997) provide evidence that segmentation reduces foreign investors' gains from diversification. They argue that this might possibly discourage stock market liquidity. I, therefore, expect that the negative impact of economic policy uncertainty should be more pronounced in a segmented market. I use *Trade Openness* as a proxy for a segmented market. I calculate *Trade Openness* as total trade (exports + imports) relative to a country's GDP in a year. A higher value on *Trade Openness* means less segmentation or more integration. I, therefore, expect a negative sign on trade openness as it should help reduce illiquidity. I posit the testable hypothesis as:

$H_0$3: Trade Openness does not affect the economic policy uncertainty-liquidity relationship.

H_a3: Trade Openness helps combat the negative impact of economic policy uncertainty on stock market liquidity.

4.2.3 Funding Constraint and Economic Policy Uncertainty

Funds are the lifeblood of financial markets. Investors require funds or provision of funds to be able to trade. While trading in the market, a typical trader covers only the margin, which is the difference between stock price and its collateral value. Soderberg (2008) shows that funding liquidity consistently affects the bond and stock market for three Scandinavian markets: Denmark, Sweden, and Norway. Brunnermeier and Pederson (2009) show that market liquidity and funding liquidity (Constraints) are mutually reinforcing and cause liquidity spirals. Funding liquidity is the driver of market liquidity. When financial intermediaries face funding constraints, they post the margins and pledge the securities held as collateral. During uncertain times, intermediaries suffer losses in the value of collateral or face increasing margins. These forces push the financial intermediaries to liquidate their position among securities and reduce the supply of liquidity to the

traders. In turn, traders fail to provide market liquidity. Kyle and Xiong (2001) present the '*wealth effect*' using a model with two risky assets and three types of traders. They argue that financial intermediaries are perfectly competitive convergence traders who trade in both risky assets. Noise traders, on the other hand, trade-in any one market randomly. Convergence traders speculate temporary deviations in security prices from their long-term mean. Since they trade in both the securities, when they suffer losses, they liquidate their position in both the markets as they have reduced capacity of bearing losses. This wealth effect results in reduced market liquidity. In the multiperiod model of Gromb and Vayanos (2002), arbitrageurs supply liquidity to the market. In an attempt to exploit discrepancies in two markets, they need to collateralize their position in each asset which creates a financial constraint and reduces market liquidity. Garleanu and Pederson (2007) argue that institutions adopt tighter risk management policies during the volatile time and lead to reduced market liquidity. The implications of these theoretical models lead to the prediction that during the time of high policy uncertainty, the market, faced with funding constraints (reduced supply of liquidity), will further restrict traders' ability to provide market liquidity. Following Karolyi et al. (2012) and Soderberg (2008), I use *Short-term interest rates* as a proxy for funding constraints. The government's monetary policy affects both bond and stock market liquidity, but the impact on bond market is observed quickly relative to the stock market that shows delayed response (Goyenko and Ukhov,2009). I, therefore, use previous months' short-term interest rates to test the impact of funding constraints. I posit testable hypothesis as:

$H_0$4: Short-term interest rates do not affect the economic policy uncertainty-liquidity relationship.

H_a4: High level of Short-term interest rate exacerbates the negative impact of economic policy uncertainty on stock market liquidity.

4.2.4 Governance and Economic Policy Uncertainty

"*Governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored, and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them."*[19] Capability, efficiency, and accountability of political and regulatory institutions of a country define the quality of its governance structure. It governs the behavior of individuals and firms operating in a country. Investors' willingness to participate in the equity market depends not only on the laws in place but also on the *confidence* in enforcing those laws (Eleswarapu and Venkataraman, 2006). The strength of a country's governance mechanism reflects effective enforcement of those laws. Investors of a country that offers a strong governance system do not hesitate to participate in equity markets.

Other things being equal, a country with a strong governance system and sound political institutions should have higher market liquidity.[20] I use an aggregate of World Governance Indicators (WGI) by Kaufmann et al. (2010) from World Bank Database as a proxy for a country's governance. It has six components: voice and accountability, regulatory quality, political stability and absence of violence, the rule of law, government effectiveness, and control of corruption. At the time of high uncertainty about economic policies, investors should not reduce the trading activities much due to trust in the country's strong governance mechanism. Among the six components of world governance indicators, political stability and government effectiveness seem

[19] http://info.worldbank.org/governance/wgi/

[20] Supporting this conjecture Lee and Ng (2009) provide evidence country level corruption negatively affects firm value. Eleswarapu and Venkataraman (2006) stress the importance of sound political institutions for the development of liquid and vibrant capital markets, due to the trust that they offer to the investors.

to be more relevant in policy decisions. Therefore, I use political stability and government effectiveness as other porxies for country's governance mechanism. I conjecture the following testable hypothesis:

$H_0$5: The strength of a country's governance does not affect the economic policy uncertainty-liquidity relationship.

H_a5: Stronger governance helps combat the negative impact of economic policy uncertainty on stock market liquidity.

4.3 Data and Methodology

4.3.1 Sample Construction

My study sample consists of twenty-four countries spanning a sample period of twenty-three years from 1997 through 2019. My sample includes both developed and emerging countries. I classify the countries as developed or emerging using the MSCI market classification. According to this classification, fourteen out of twenty-four countries are developed, including Australia, Belgium, Canada, France, Germany, Ireland, Italy, Japan, Netherlands, Singapore, Spain, Sweden, United Kingdom (U.K.), and the United States (U.S.). The remaining ten countries are emerging countries named Brazil, Chile, Colombia, Croatia, Greece, India, Korea, Mexico, Pakistan, and Russia. To calculate liquidity measures, I collect daily return and price data for all countries except for the U.S., from Thompson Reuters Datastream and the U.S. price and return variables from the Centre for Research in Security Prices (CRSP). I obtain all the variables in U.S. dollars. In my sample, I include only one major stock exchange from each country except for South Korea (Korea Stock Exchange and KOSDAQ) and the U.S. (NYSE and Nasdaq). Following the prior literature (Karolyi et al., 2012; Ma et al., 2019), I choose the stock exchange that trades most securities in that country. I retain all the dead stocks in the sample to avoid survivorship bias.

I calculate daily returns using the total return index (RI) of each stock. The RI variable in Datastream controls for dividends and stock splits and is reported to the nearest hundredth. To ensure data accuracy, I apply some return filters to my data. Following Karolyi et al. (2012), I delete the observations in top and bottom 0.1% of the cross-sectional distribution of returns within each country. I exclude non-trading days. Following Karolyi et al. (2012), I define non-trading days as the days when 90% or more of the stocks in a country have a zero return. I also exclude a stock with zero returns for more than 80% of the days in a given month considering that stock is illiquid.

Due to the concerns of data errors, I apply some additional return filters. Following Griffin et al. (2010), I set the returns >200% as missing. I also set the returns (both $r_{i,d}$ and $r_{i,d-1}$) as missing if $(1+r_{i,d}) * (1+r_{i,d-1})-1$ is less than 20% and $r_{i,d}$ or $r_{i,d-1}$ is greater than 100%, where $r_{i,d}$ is the return on stock i on day d.

I get the data from World Development Indicators (WDI) and use World Governance Indicators (WGI) from the World Bank database for macro variables. I use the aggregate of all six components of WGI of Kaufmann et al. (2010) to divide the countries into two groups with strong and weak governance. This data is available from the World Bank database. I divide the aggregate index into three terciles. The countries in the first tercile are weak governance countries, and the third tercile countries are strong governance countries. I use the Fama-French 48 industry classification to differentiate industries. I winsorize my liquidity and other main control variables at 1% and 99% to deal with the outliers.

4.3.2 Measure of Economic Policy Uncertainty

In this section, I discuss the main variable of interest, *i.e.*, economic policy uncertainty, and the measure of other variables in the following section.[21]

I use monthly news-based EPU index developed by Baker et al. (2016) for Australia, Brazil, Canada, France, Germany, India, Italy, Mexico, South Korea, Russia, United Kingdom, and the United States; Cerda et al. (2016) for Chile; Gil and Silva (2018) for Colombia; Hardouvelis et al. (2018) for Greece; Zalla (2016) for Ireland; Arbatli et al. (2019) for Japan; Kroese et al. (2015) for the Netherlands; Davis (2016) for Singapore; Ghirelli et al. (2019) for Spain; and Armelius et al. (2017) for Sweden, to measure EPU. The index captures uncertainties about economic policy decisions and their economic effect. The index is created using the count of news articles in leading newspapers that may directly or indirectly lead to EPU. A newspaper article qualifies to be counted for index preparation if that contains a combination of keywords covering three different areas, *i.e.*, uncertainty, policy, and economy. It specifies keywords or variations thereof that reflect any of the three areas. The keywords are: "uncertainty" or "uncertain"; "Federal Reserve"; "congress"; "deficit"; "legislation"; "regulation"; "White House"; "economy" or "economic" from the leading newspapers of the respective country. The keywords may differ across countries to ensure that the right keywords are picked based on the country. For e.g., keywords for India include "RBI," "Reserve Bank," "Prime Minister's Office," "PM Office," "Lok Sabha," "excise duties," and "customs duties," whereas keywords for Japan include "Bank of Japan," "BOJ." To control for volume variations across newspapers and time, the raw counts are scaled by the total number of articles in that newspaper in that month. These numbers are then

[21] Appendix Table 4A provides the description of all the variables along with their data sources.

standardized to unit standard deviation over time and averaged across the newspapers in that country every month.

The methodology used to create the index raises a concern in using the EPU index as a measure of economic policy uncertainty. Since the index captures uncertainty based on the news articles containing a combination of three different terms referring to economy, policy, and uncertainty, it might capture other sources of macroeconomic uncertainty along with economic policy uncertainty. To deal with this issue, I control for the additional macroeconomic variables in the analysis following Duong et al. (2020) and Bloom (2009).

4.3.3 Market Liquidity Measure

Since my study is international with a large sample size and longer time duration, high-frequency data availability is an issue. Hence, I use low-frequency liquidity measures following prior literature. For the baseline results, I use both Amihud's illiquidity measure (*Ami_Illiquidity*); and the modified version of Amihud's illiquidity measure (*Modified LIQ*) as used in Karoyli et al. (2012). For the rest of the analysis, I follow the prior literature (Acharya and Pedersen, 2005; Avramov et al., 2006; Mahanti et al., 2008; Dick-Nielsen et al., 2012; Karolyi et al., 2012; Amihud et al., 2015 among others), and use Amihud's illiquidity measure. Using low-frequency data, Amihud's illiquidity measure is the best liquidity proxy for global research (Fong et al., 2017). It measures the daily price response per dollar of the trading volume. The illiquidity measure is calculated as the monthly average of the ratio of daily absolute stock returns to the dollar trading volume for that day.

$$Ami\_Illiquidity_{i,d} = 1/\mathrm{N}_{i,d} \left(\sum_{\mathrm{N}i,}^{d} \frac{|R_{i,d} \quad |}{P_{i,d} * V_{i,d}} \right)$$

Where $R_{i,d}$ is the dollar return by of stock *i* on day *d*. $P_{i,d}$ is the dollar price of stock *i* on day *d*, and $V_{i,d}$ is the trading volume of stock *i* on day *d*.

To reduce the impact of outliers, following Karolyi et al. (2012), I modify Amihud's illiquidity measure and multiply the measure by -1 to make the interpretation simpler. The modified version of Amihud's illiquidity measure (*Modified* $LIQ_{i,d}$) is as follows:

$$\textit{Modified } LIQ_{i,d} = -\log\left(1+\frac{|R_{i,d}|}{P_{i,d} * V_{i,d}}\right)$$

Where *Modified* $LIQ_{i,d}$ is a modified version of Amihud's liquidity measure. $R_{i,d}$ is the dollar return of stock *i* on day *d*. $P_{i,d}$ is the dollar price of stock *i* on day *d*, and $V_{i,d}$ trading volume of stock *i* on day *d*.

For the above measure, I first calculate the daily liquidity and then average it over the month to calculate the monthly liquidity at the security level. I calculate both equally weighted and value weighted averages across all the stocks in that month to obtain market liquidity. I use the market value of equality in year n-1 to get the weights.

4.3.4 Other Variables

Trade Openness:

$$\textit{Trade Openness}_{i,n} = \frac{Exports_{i,n} + Imports_{i,n}}{GDP_{i,n}}$$

Where $Exports_{i,n}$ is the U.S. dollar value of total exports of country *i* in year *n*, $Imports_{i,n}$ is the US dollar value of total imports of country *i* in year *n* and $GDP_{i,n}$ is the total U.S. dollar value of the gross domestic product of country *i* in year *n.*

Governance:

I aggregate the six components of World Governance Indicators (WGI) by Kaufmann et al. (2010) from World Bank Database. The six components are voice and accountability, regulatory quality, political stability and absence of violence, rule of law, government effectiveness, and control of corruption. They take the values from -2.5 to +2.5. A higher value on each component indicates strong governance.

4.3.5 Controls

Macroeconomic Instability: Some countries reflect relatively unstable market fundamentals due to macroeconomic instability. Macroeconomic instability may negatively impact financial market development (Claessens et al., 2006; Ehigiamusoe et al., 2020). Following the prior literature (Morck et al., 2000; Karolyi et al., 2012 and Ma et al., 2019), I use GDP growth volatility to control for macroeconomic instability. Using Morck et al. (2000) approach, I calculate GDP growth volatility for each country as the standard deviation of GDP growth rate in our sample period, *i.e*., from 1997 to 2019.

Country Size: The geographical area of a country can affect the overall economic activity. In a small country, any environmental or political event may have a market-wide impact which may not be as evident in a bigger country (Morck et al., 2000). Additionally, factor endowment is less uniform in a large country, reflecting less uniformity in stock market movements (Bernstein and Weinstein, 2002). Therefore, the stock market in bigger countries may absorb economic shocks that reflect less impact on market liquidity. I, therefore, control for country size and use the natural log of land area in square kilometers as a proxy for country size.

Number of Unique Stocks: Following Karolyi et al. (2012), I also control for stock market size calculated as no. of unique stocks traded on that market.

Market Volatility: Literature provides evidence that market makers require additional risk premium during the period of high market volatility. Hence market volatility negatively affects stock market liquidity. Garleanu and Pedersen (2007) argue that institutions tighten risk management during high volatility periods and reduce market liquidity. Ho and Stoll (1983), O'Hara and Oldfield (1986) argue that market volatility can affect liquidity in bond and stock markets by affecting inventory risk borne by market makers. As this risk increases, market makers increase bid-ask spread to compensate for the additional risk. Chung and Chuwonganant (2018) find that market volatility affects market returns through the channel of stock market liquidity. Market volatility, therefore, should have a negative impact on market liquidity. I use the standard deviation of past twelve months' daily value-weighted market returns to control for market volatility

Market Returns: A market that offers a higher return is attractive to the investors resulting in higher liquidity. Jun et al. (2003) find a positive relation between stock returns and aggregate market liquidity. I use value-weighted market returns to control for market returns.

4.4 Empirical Results

4.4.1 Descriptive Statistics

Table 4.1 Panel A reports the descriptive statistics of market illiquidity using Amihud's measure of illiquidity (*Ami_illiquidity*) for all the 24 countries in the sample. The descriptive statistics include minimum, 10th percentile, median, 90th percentile, maximum, mean, and standard deviation respectively in columns (3) through (9) for the illiquidity. The average value of Amihud's illiquidity score is highest in India with a value of 20.037, and the median value is 16.484, and the maximum value reaching up to 64.860. It might be because India has a large number of listed stocks, but most of these stocks are not actively traded. Amongst the developed countries, Singapore reports the highest level of average illiquidity. On further investigation, I

found that the highest level of illiquidity is recorded for the year 2019 and later part of 2018. It is because due to heightened uncertainty pertaining to the US-China trade war, the international trade of Singapore got adversely affected. Singapore's economy recorded its lowest GDP growth since the 2009 financial crisis.[22]

Table 4.1 Panel B presents the summary statistics of the EPU index for all the 24 countries in the sample. The descriptive statistics include minimum, 10th percentile, median, 90th percentile, maximum, mean, and standard deviation respectively in columns (3) through (9) respectively. The average value of EPU score in the U.K. is the highest, followed by France. It peaked with a value of 1141.796 in July 2016. The highest value on the UK reflects all uncertainties around significant events related to Brexit. France being a part of the European Union, also displayed the highest level of uncertainty during 2016 and 2017 when Brexit-related uncertainty was highest.

Table 4.1 Panel C and D reports the summary statistics of the country-level variables and all the control variables for the developed and emerging countries, respectively. All values from columns (5) through (15) reflect time-series averages over the sample period. Columns 3 and 4 report the beginning and ending date of date for each country. For most countries, the sample period starts from 1997-01 except for Belgium, Singapore, Croatia, and Pakistan, for which the EPU index is available beginning in 2001-01, 2003-01, 2003-01, and 2010-08, respectively. The EPU index for Mexico is available only up to 2019-09. Columns 5 and 6 report average market return and market return volatility. Columns 7 shows the number of unique stocks.

[22] "*With trade tensions between the US-China unlikely to abate anytime soon, we expect exports and trade-related services to push the economy into technical recession in Q3*," Sian Fenner, Oxford Economics (cited from https://www.cnn.com/2019/08/13/economy/singapore-gdp-recession-trade-war)

Table 4.2 reports the correlations of all the variables used in the analysis. The results show that *# Unique Stocks* are negatively correlated to illiquidity. *GDP per capita, Financial Development index, Financial Efficiency Index, World Gov. Index, Political Stability,* and *Govt. Effectiveness* are negatively correlated to illiquidity, which is as expected. *Political Stability* and *Govt. Effectiveness* are highly correlated to *World Gov. Index* as they all proxy for a country's governance. *Short-term Interest Rate* is negatively correlated to *GDP per capita,* which shows a high level of interest rate in countries with low GDP per capita. All the three proxies for governance are positively correlated to *GDP per capita,* showing better governance in economically stronger countries. *Financial Efficiency Index* is negatively correlated to *Short-term Interest Rate* and highly positively correlated to the three proxies for governance, which is consistent with conventional wisdom and prior literature. To deal with multicollinearity concerns in my analysis, I do not use highly correlated variables in a single model.

4.4.2 Impact of Economic Policy Uncertainty on Stock Market Liquidity

This section of the study purports to investigate the impact of economic policy uncertainty on stock market liquidity. I also examine how different country characteristics, including information asymmetry, market integration, funding constraint, and governance, influence the economic policy uncertainty-liquidity relationship. I use unbalanced Panel data for country-level monthly liquidity and economic policy uncertainty. I use the following baseline model to capture the impact of economic policy uncertainty on stock market liquidity globally.

$$LIQ_{,i,t} = \alpha + \beta\ Home\_EPU_{i,t} + \ \gamma\ Macro\_Controls_{i,t} + \epsilon_{i,t}$$

$LIQ_{,i,t}$ is stock market illiquidity (liquidity) using different measures of illiquidity (liquidity)[23] for country i in month t calculated as the value-weighted average of monthly illiquidity (liquidity) of all the stocks in the sample in a country[24]. $Home\_EPU_{i,t}$ is the natural log of the domestic economic policy uncertainty index (EPU index) for country i in month t. $Macro\_Controls_{i,t}$ represents various explanatory variables at the country level, which are *Market Volatility, Market Return, #Unique Stocks, Geog. Area,* and *GDP Growth Volatility*.[25]

I test my first hypothesis using the baseline model. Table 4.3 reports the estimates of regression using two illiquidity (liquidity) measures calculated as equally weighted and value-weighted measures of monthly stock illiquidity (liquidity) in the country for the global sample of 24 countries. Columns 1 and 2 use *Ami_illiquidity,* and columns 3 and 4 use *Modified LIQ* measure. The results are consistent across all four columns indicating a detrimental impact of EPU on stock market liquidity. However, the coefficient using an equally weighted measure is bigger than the value weighted measure, indicating that small stocks are more illiquid than large stocks.

Table 4.4 Panel A reports the result of the role of financial development in shaping the EPU-market liquidity relationship. Columns (1 and 2) use *GDP Growth* as a proxy of financial development without and with the interaction term, respectively. Columns (3 and 4) use Financial Development Index as a proxy of financial development without and with the interaction term, respectively. Columns (5 and 6) use *Financial Efficiency Index* as a proxy of financial development without and with the interaction term, respectively. Using all the three proxies of financial

[23] I present the baseline results in Table 3 using Amihud's measures of illiquidity and modified liquidity measure following Karolyi et al. 2012. All other results are reported using Amihud's illiquidity measure.

[24] In Table 3 I also calculate the illiquidity (liquidity) as simple average of illiquidity (liquidity) of all the sampled stocks in month *t* for country *i*.

[25] Appendix Table 4A provides the description and calculation of all the variables.

development, the results show that financially developed markets absorb EPU shocks to stock market liquidity more effectively compared to less developed financial markets. Based on the results, I conclude that country-level financial development is one of the determinants of the liquidity-policy uncertainty relationship.

Table 4.4 Panel B shows the result of the role of market integration and funding constraints in shaping the EPU-market liquidity relationship. Column (1) and (2) shows the results for the impact of market integration. I use trade openness as a proxy for market integration. Column (1) shows that trade openness does not have a significant impact on stock market liquidity. As opposed to the prediction, column (2) shows that the interaction term on domestic policy uncertainty and trade openness has a positive and significant sign. It shows that economic policy uncertainty leads to more illiquidity in the countries with a high level of trade openness. I argue that exporters and importers are generally big-sized firms, and they get affected more due to the economic policy uncertainty. The impact is more severe as they are exposed to both the policies related to domestic business as well as policies related to international trade. I calculate stock market liquidity as the value-weighted average of firms' liquidity. Therefore, the impact on large firms will dominate the overall result[26].

The results in columns (3) and (4) of Table 4.4 Panel B show that a high level of short-term interest rates is detrimental to stock market liquidity. Amid heightened EPU, the increase in short-term interest rate further worsens the market liquidity. These results are consistent with the theoretical prediction of Garleanu and Pederson (2007). The results are also consistent with

[26] For the scope of present investigation, I only use trade openness as a proxy for market integration. It requires in-depth analysis, so it would be more interesting to study different kinds of market integration like equity market integration commonality of ownership structure, in shaping the impact of EPU on market liquidity.

empirical evidence of Comerton-Forde et al. (2010), Hameed et al. (2010), Jensen and Moorman (2010), Kahraman and Tookes (2017), and Ye et al. (2020), who find that funding constraints negatively affect stock market liquidity. Karoyli et al. (2012) find that funding constraints moderately determine the commonality of liquidity. Adding to the literature, I further provide evidence that funding constraints amplify the impact of EPU on market liquidity.

Table 4.4 Panel C shows the results for the role of country-level governance in shaping the EPU-liquidity relationship. I use political stability, government effectiveness, and the world governance index (aggregate value of six indicators) as the proxies for governance. The results show that government effectiveness helps combat the negative impact of EPU on stock market liquidity. Politically stable countries have lower liquidity, but when economic policy uncertainty increases, the liquidity worsens in politically stable countries. The results are consistent with Lee et al. (2016), who find a bigger effect on stock market liquidity to unscheduled changes to monetary policies. In politically stable countries, investors do not expect frequent changes in economic policies, whereas, in politically unstable countries, the investors expect frequent changes and react less severely. The results for the aggregate governance index are not significant as it is a combination of different aspects of governance. However, not all the aspects affect the EPU-liquidity relationship in a similar way.

Table 4.4 Panel D uses different proxies of information asymmetry, funding constraint, market integration, and governance together.[27] The results for all three governance measures are consistent with prior results. Government effectiveness helps to reduce the negative impact of EPU on stock market liquidity, whereas overall governance remains insignificant.

[27] I do not use the variables with high correlation in a single model due to multicollinearity concerns.

4.4.3 Robustness Check

Due to the potential concern of confounding effect of the U.S. economic policy uncertainty, I run some robustness checks. The U.S. being one of the strongest economies with a highly developed financial market, might drive or at least influence the economic policy uncertainty of other markets. To deal with this issue, I get a subsample excluding the U.S. and run the baseline regression controlling for U.S. economic policy uncertainty. Table 4.5 columns (1), (2),(5), and (6) report the estimates of this regression. Domestic country's economic policy uncertainty remains positive and significant, suggesting a decrease in stock market liquidity with a surge in economic policy uncertainty even after controlling for the U.S. economic policy uncertainty. Additionally, the U.S. economic policy uncertainty also negatively affects stock market liquidity. The results suggest a spillover effect of the U.S. economic policy uncertainty on other markets' stock liquidity.

Additionally, I get the residual of the regression of EPU on the U.S. EPU and use this residual in my analysis. It gives that part of EPU which is not affected by the U.S. EPU. Using the residual EPU, I find consistent results in columns (3), (4), (7), and (8) of Table 4.5 and Table 4.6 Panel A through C.

4.5 Conclusions

Market liquidity is one of the major concerns of policymakers. More specifically, the liquidity dry-up during the financial crisis has made it even more of a concern. Liquidity dry-up may lead to further illiquidity spirals making a recovery more difficult. In this essay, I provide cross-country evidence on the detrimental impact of economic policy uncertainty on liquidity. Using a large dataset from 24 developed and emerging countries from 1996 through 2019, I report a significant negative impact of economic policy uncertainty on stock market liquidity.

I further examine the cross-sectional variations based on country characteristics in the impact of economic policy uncertainty on stock market liquidity. I show that the financial development of a country and the governance mechanism help mitigate the negative effect of economic policy uncertainty on stock market liquidity. However, the market integration captured through trade openness worsens the impact. It requires further understanding using other proxies for market integration, capturing equity market integration, or the ownership structure. My study documents economic policy uncertainty as an essential determinant of stock market liquidity globally. Overall, my study has implications for policymakers and suggests a better governance structure and more developed financial markets are critical to keep the markets liquid and ensure efficient utilization of resources.

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TABLES

Table 4.1 Panel A: Summary Statistics of Market Illiquidity

This table reports descriptive statistics of market illiquidity using Amihud's measure of illiquidity (*Ami_illiquidity*). The descriptive statistics include minimum, 10th percentile, median, 90th percentile, maximum, mean, and standard deviation in columns (3) through (9) for the illiquidity. These are the time-series averages (over the period from the first month in the sample to 2019-12) for 24 countries in the sample. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Country	**ISO**	**Min**	**P10**	**Median**	**P90**	**Max**	**Mean**	**Standard Deviation**
Developed								
Australia	AUS	0.087	0.131	0.257	0.697	15.908	0.523	1.350
Belgium	BEL	0.013	0.020	0.106	0.273	0.886	0.132	0.123
Canada	CAN	0.044	0.058	0.105	0.327	0.623	0.160	0.119
France	FRA	0.015	0.026	0.048	0.163	0.603	0.078	0.081
Germany	DEU	0.008	0.052	0.127	0.259	0.447	0.143	0.088
Ireland	IRL	0.025	0.067	0.268	0.965	2.882	0.412	0.460
Italy	ITA	0.003	0.010	0.024	0.057	0.127	0.029	0.021
Japan	JPN	0.003	0.006	0.027	0.073	0.166	0.033	0.029
Netherlands	NLD	0.004	0.011	0.022	0.048	0.123	0.028	0.021
Singapore	SGP	0.030	0.148	0.437	2.585	39.334	1.421	4.351
Spain	ESP	0.004	0.007	0.016	0.044	0.781	0.027	0.058
Sweden	SWE	0.028	0.049	0.108	0.250	0.780	0.135	0.101
United Kingdom (UK)	GBR	0.016	0.024	0.044	0.104	1.483	0.073	0.140
United States (USA)	USA	0.002	0.004	0.008	0.031	0.055	0.014	0.011
Emerging								
Brazil	BRA	0.077	0.148	0.316	0.862	4.891	0.451	0.486
Chile	CHL	0.071	0.111	0.316	1.477	4.049	0.581	0.616
Colombia	COL	0.006	0.015	0.104	0.866	4.256	0.310	0.468
Croatia	HRV	0.124	0.620	1.287	2.941	45.393	1.883	3.112
Greece	GRC	0.021	0.106	0.543	4.037	11.480	1.406	1.856
India	IND	1.946	7.246	16.484	38.726	64.860	20.037	12.868
Korea	KOR	0.008	0.013	0.038	0.428	9.457	0.184	0.636
Mexico	MEX	0.064	0.149	0.299	0.812	2.052	0.389	0.317
Pakistan	PAK	0.736	1.269	3.228	10.461	43.360	4.911	4.819
Russia	RUS	0.001	0.008	0.035	0.325	17.968	0.285	1.329

Table 4.1 Panel B: Summary Statistics of Economic Policy Uncertainty

This table reports descriptive statistics of the EPU index by Baker et al., 2016. The descriptive statistics include the minimum, 10th percentile, Median, 90th percentile, maximum, mean, and standard deviation in columns (3) through (9) for the EPU index. These are the time-series averages (over the period from the first month in the sample to 2019-12) for 24 countries in the sample. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Country	**ISO**	**Min**	**P10**	**Median**	**P90**	**Max**	**Mean**	**Standard Deviation**
Developed								
Australia	AUS	25.662	43.565	87.931	186.147	337.044	99.932	56.453
Belgium	BEL	58.950	73.870	92.830	129.510	224.800	99.958	27.465
Canada	CAN	30.097	55.006	127.699	290.395	495.852	150.917	94.362
France	FRA	11.287	48.076	147.119	300.531	574.633	163.621	102.913
Germany	DEU	28.434	64.007	116.425	210.185	454.005	131.196	64.237
Ireland	IRL	19.994	45.392	107.840	196.707	282.128	113.655	57.707
Italy	ITA	31.702	64.251	104.256	161.014	243.886	109.311	38.243
Japan	JPN	48.569	70.346	103.280	153.553	237.048	109.886	35.951
Netherlands	NLD	27.213	54.464	91.725	143.622	233.731	95.967	36.058
Singapore	SGP	49.475	62.269	117.459	220.406	344.826	128.656	60.940
Spain	ESP	31.018	62.383	97.105	144.523	234.368	101.967	34.109
Sweden	SWE	53.734	68.697	92.366	116.232	156.730	92.879	18.978
United Kingdom (UK)	GBR	25.341	55.626	134.338	419.099	1141.796	189.527	156.790
United States (USA)	USA	44.783	70.600	109.635	185.592	284.136	120.914	47.693
Emerging								
Brazil	BRA	22.296	55.860	123.678	255.601	676.955	141.996	89.607
Chile	CHL	31.601	57.877	100.432	171.258	283.699	110.098	46.571
Colombia	COL	41.074	60.580	96.130	153.035	236.348	103.529	34.746
Croatia	HRV	1.740	27.020	88.665	177.210	315.450	101.773	61.970
Greece	GRC	37.696	69.409	94.302	138.167	188.705	98.894	27.004
India	IND	24.940	42.347	84.144	155.971	283.689	94.653	47.029
Korea	KOR	22.427	57.671	113.981	209.300	538.177	126.988	68.804
Mexico	MEX	8.509	32.309	75.629	178.801	428.725	94.934	69.049
Pakistan	PAK	33.830	53.250	91.590	137.320	205.300	94.080	34.241
Russia	RUS	12.399	35.793	104.882	250.455	431.247	127.196	84.486

Table 4.1 Panel C: Summary Statistics of Country-Level Variables (Developed Countries)

This table reports average values of *Market Return*, *Market Volatility*, *#Unique Stocks*, *GDP Growth*, *Trade Openness*, *Financial Development Index*, *Financial Efficiency Index*, *Short-term Interest Rate*, *Govt. Effectiveness*, *Political Stability*, and *World Gov. Index* from columns (5) through (15). These are the time-series averages (over the period from the first month in the sample to 2019-12) for 14 developed countries in the sample. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically. Columns (3) and (4) show the beginning and ending date of the sample. Appendix Table 4A describes the variables.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Country	**ISO**	**Start Date**	**End Date**	***Market Return***	***Market Volatility***	***# Unique stocks***	***GDP Growth***	***Trade Openness***	***Financial Development Index***	***Financial Efficiency Index***	***Short-term Interest Rate***	***Govt. Effectiveness***	***Political Stability***	***World Gov. Index***
Developed														
Australia	AUS	1997-01	2019-12	1.307	1.032	3151	3.126	0.416	0.880	0.788	4.563	1.701	0.989	9.538
Belgium	BEL	2001-01	2019-12	1.018	0.930	348	1.879	1.479	0.643	0.408	1.834	1.568	0.776	7.855
Canada	CAN	1997-01	2019-12	1.338	0.828	3237	2.444	0.688	0.830	0.749	2.419	1.826	1.066	9.755
France	FRA	1997-01	2019-12	1.113	0.889	1708	1.641	0.564	0.751	0.818	2.314	1.512	0.440	7.156
Germany	DEU	1997-01	2019-12	1.153	0.993	1451	1.421	0.741			3.308	1.634	0.855	8.988
Ireland	IRL	1997-01	2019-12	1.620	1.182	97	5.653	1.793	0.724	0.242	2.351	1.508	1.135	8.896
Italy	ITA	1997-01	2019-12	0.994	0.933	793	0.578	0.521	0.749	0.963	2.240	0.507	0.516	3.662
Japan	JPN	1997-01	2019-12	0.765	1.088	4000	0.774	0.278	0.791	0.929	0.142	1.475	1.040	7.411
Netherlands	NLD	1997-01	2019-12	0.968	0.926	307	1.954	1.330	0.779	0.875	2.925	1.863	1.061	10.173
Singapore	SGP	2003-01	2019-12	1.308	0.868	858	4.970	3.605	0.722	0.600	1.266	2.167	1.257	9.128
Spain	ESP	1997-01	2019-12	1.047	1.087	319	2.158	0.582	0.850	0.989	2.196	1.225	0.066	5.688
Sweden	SWE	1997-01	2019-12	1.293	1.167	1288	2.504	0.826	0.750	0.833	2.208	1.930	1.185	10.507
UK	GBR	1997-01	2019-12	0.688	0.694	4072	2.082	0.557	0.858	0.872	3.199	1.645	0.444	8.715
USA	USA	1997-01	2019-12	0.773	1.036	20712	2.414	0.263	0.880	1.000	2.058	1.583	0.451	7.737

Table 4.1 Panel D: Summary Statistics of Country-Level Variables (Emerging Countries)

This table reports average values of *Market Return*, *Market Volatility*, *#Unique Stocks*, *GDP Growth*, *Trade Openness*, *Financial Development Index*, *Financial Efficiency Index*, *Short-term Interest Rate*, *Govt. Effectiveness*, *Political Stability*, and *World Gov. Index* from columns (5) through (15) respectively. These are the time-series averages (over the period from the first month in the sample to 2019-12) for ten emerging countries in the sample. Countries are classified into two groups (developed and emerging, based on MSCI market classification) and listed alphabetically. Columns (3) and (4) show the beginning and ending date of the sample. Appendix Table 4A provides the definitions of the variables.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Country	**ISO**	**Start Date**	**End Date**	***Market Return***	***Market Volatility***	***# Unique stocks***	***GDP Growth***	***Trade Openness***	***Financial Development Index***	***Financial Efficiency Index***	***Short-term Interest Rate***	***Govt. Effectiveness***	***Political Stability***	***World Gov. Index***
Emerging														
Brazil	BRA	1997-01	2019-12	1.952	1.643	654	2.262	0.249	0.526	0.637	14.414	-0.116	-0.181	-0.122
Chile	CHL	1997-01	2019-12	1.021	0.896	229	3.765	0.643	0.465	0.158	5.252	1.157	0.508	6.784
Colombia	COL	1997-01	2019-12	1.213	1.020	74	3.306	0.365	0.323	0.206	8.786	-0.105	-1.524	-2.288
Croatia	HRV	2003-01	2019-12	1.796	1.179	167	2.092	0.830	0.425	0.056	4.695	0.499	0.581	2.223
Greece	GRC	1997-01	2019-12	1.274	1.302	447	0.845	0.566	0.548	0.505	2.289	0.535	0.222	3.031
India	IND	1997-01	2019-12	1.753	1.003	3428	6.457	0.402	0.424	0.841	8.164	-0.024	-1.117	-1.393
Korea	KOR	1997-01	2019-12	2.255	1.530	3317	4.121	0.772	0.788	1.000	4.164	1.046	0.363	4.496
Mexico	MEX	1997-01	2019-09	1.140	1.003	287	2.452	0.601	0.360	0.329	8.589	0.163	-0.568	-0.926
Pakistan	PAK	2010-08	2019-12	2.046	1.153	557	4.010	0.309	0.282	0.695	9.427	-0.615	-2.173	-6.045
Russia	RUS	1997-01	2019-12	3.427	2.103	79	3.328	0.532	0.485	0.665	9.301	-0.346	-0.939	-4.286

Table 4.2: Correlation Matrix

This table reports Pearsons correlation coefficients of *Ami_illiquidity, Home_EPU, Market Volatility, Market Return,#Unique Stocks, GDP Growth Volatility, GDP Growth, Financial Development Index, Financial Efficiency Index, Trade Openness, Short-term Interest Rate, World Gov. Index, Political Stability,* and *Govt. Effectiveness*. Appendix Table 4A provides the definitions of the variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Variables	***Ami_illiquidity***	***Home_EPU***	***Market Volatility***	***Market Return***	***# Unique Stocks***	***Geog. Area***	***GDP Growth Volatility***	***GDP Growth***	***GDP per capita***	***Financial Development Index***	***Financial Efficiency Index***	***Trade Openness***	***Short-term Interest Rate***	***World Gov. Index***	***Political Stability***
Home_EPU	-0.040	1.000													
Market Volatility	0.114	0.139	1.000												
Market Return	0.000	-0.106	-0.171	1.000											
# Unique Stocks	-0.251	0.181	-0.057	-0.016	1.000										
Geog. Area	-0.040	0.080	0.113	-0.018	0.334	1.000									
GDP Growth Volatility	0.193	-0.044	0.236	0.027	-0.496	-0.209	1.000								
GDP Growth	0.095	-0.208	-0.122	0.042	-0.039	-0.001	0.141	1.000							
GDP per capita	-0.560	0.168	-0.109	-0.033	0.257	-0.353	-0.024	-0.253	1.000						
Financial Development Index	-0.444	0.161	0.066	-0.043	0.682	0.086	-0.370	-0.146	0.392	1.000					
Financial Efficiency Index	-0.565	0.197	-0.068	-0.014	0.561	-0.171	-0.170	-0.173	0.833	0.733	1.000				
Trade Openness	0.104	-0.041	-0.044	0.020	-0.277	-0.742	0.399	0.212	0.304	-0.147	0.139	1.000			
Short-term Interest Rate	0.302	-0.075	0.289	-0.034	-0.128	0.332	0.052	0.037	-0.578	-0.197	-0.486	-0.220	1.000		
World Gov. Index	-0.324	0.084	-0.157	-0.012	0.304	-0.392	-0.161	-0.062	0.816	0.320	0.772	0.356	-0.476	1.000	
Political Stability	-0.278	0.055	-0.061	-0.005	0.221	-0.408	0.011	-0.097	0.797	0.265	0.698	0.383	-0.423	0.901	1.000
Govt. Effectiveness	-0.336	0.069	-0.177	-0.008	0.335	-0.419	-0.171	-0.020	0.789	0.326	0.754	0.426	-0.487	0.970	0.844

Table 4.3: Impact of EPU on Stock-Market Liquidity

This table presents the empirical results for the baseline regression using stock market liquidity as the dependent variable. I estimate the following baseline model: $LIQi,t = \alpha + \beta Home\_EPUi,t + \gamma\ Macro\_Controlsi,t + \epsilon i,t$, where $LIQi,t$ is stock market illiquidity (liquidity) using Amihud's illiquidity measure (Columns 1 and 2) and modified liquidity following Karolyi et al. (2012)(Columns 3 and 4) for country i in month t. *Home_EPUi,t* is the natural log of the domestic economic policy uncertainty index (EPU index) for country i in month t. *Macro_Controlsi,t* represents various explanatory variables at the country level, which are *Market Volatility, Market Return, # Unique Stocks, Geog. Area* and *GDP Growth Volatility*. Appendix Table 4A provides definitions of variables and their calculation.

	(1)	(2)	(3)	(4)
Variables	***Ami_illiquidity***		***Modified LIQ***	
	Equally Weighted Market Illiquidity	***Value Weighted Market Illiquidity***	***Equally Weighted Market Liquidity***	***Value Weighted Market Liquidity***
Home_EPU	0.412***	0.269***	-0.219***	-0.007***
	(12.194)	(10.891)	(-3.353)	(-6.589)
Market Volatility	0.172***	0.265***	0.064	-0.000
	(5.901)	(12.447)	(1.144)	(-0.391)
Market Return	-0.004*	-0.005***	0.006	0.000
	(-1.674)	(-2.753)	(1.304)	(0.945)
# Unique Stocks	1.140	-2.552	32.057***	0.451***
	(0.219)	(-0.673)	(3.192)	(2.904)
Geog. Area	-2.366	1.527	-39.810***	-0.558***
	(-0.366)	(0.323)	(-3.183)	(-2.882)
GDP Growth Volatility	-5.341	1.222	-71.689***	-0.997***
	(-0.457)	(0.143)	(-3.178)	(-2.855)
Constant	33.256	-6.613	433.897***	6.051***
	(0.471)	(-0.128)	(3.182)	(2.867)
Time F.E.	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes
Observations	6,253	6,253	6,253	6,253
# Countries	24	24	24	24

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.4 Panel A: Impact of Financial Development on EPU- Liquidity Relationship

This table reports the empirical results using panel regression for H_a1 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for financial development at a time along with their interaction term with Home_EPU. Country controls are the same as used in Table 4.3. Models (1) and (2) use *GDP Growth* as a proxy of financial development and its interaction with *Home_EPU*. Models (3) and (4) use *Financial Development Index* as a proxy of financial development its interaction with *Home_EPU*. Models (5) and (6) use *Financial Efficiency Index* as a proxy of financial development its interaction with *Home_EPU*. Appendix Table 4A provides definitions of variables.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Financial Development					
Home_EPU	0.230***	0.365***	0.261***	0.383***	0.255***	0.394***
	(9.523)	(11.511)	(10.222)	(4.963)	(10.015)	(8.071)
GDP Growth	-0.084***	0.129***				
	(-17.362)	(3.925)				
Home_EPU*GDP Growth		-0.046***				
		(-6.537)				
Financial Development Index			-2.124***	-1.256**		
			(-7.194)	(-2.042)		
Home_EPU*Financial Development Index				-0.199*		
				(-1.683)		
Financial Efficiency Index					0.593***	1.663***
					(6.904)	(4.994)
Home_EPU*Financial Efficiency Index						-0.230***
						(-3.320)
Market Volatility	0.246***	0.240***	0.242***	0.246***	0.248***	0.255***
	(11.829)	(11.559)	(11.204)	(11.307)	(11.513)	(11.774)
Market Return	-0.004**	-0.004**	-0.005***	-0.005***	-0.005***	-0.005***
	(-2.335)	(-2.454)	(-3.007)	(-2.944)	(-2.761)	(-2.772)
# Unique Stocks	-0.332	-0.336	-0.097	-0.090	-0.455*	-0.457*
	(-1.456)	(-1.485)	(-0.426)	(-0.430)	(-1.900)	(-1.840)
Geog. Area	0.021	0.022	-0.036	-0.037	0.037	0.037
	(0.187)	(0.198)	(-0.327)	(-0.365)	(0.317)	(0.302)
GDP Growth Volatility	0.088	0.085	0.083	0.084	0.045	0.042
	(0.366)	(0.358)	(0.350)	(0.386)	(0.176)	(0.160)
Constant	-0.592	-1.190	-0.715	-1.298	-0.465	-1.091
	(-0.266)	(-0.540)	(-0.328)	(-0.638)	(-0.200)	(-0.451)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	No	No	No	No	No	No
Observations	6,253	6,253	5,704	5,704	5,704	5,704
# Countries	24	24	23	23	23	23

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.4 Panel B: Impact of Market Integration and Funding Constraints on EPU- Liquidity Relationship

This table reports the empirical results using panel regression for H_a2 and H_a3 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and *Trade Openness* as a proxy for market integration and *Short-term Interest Rate* as a proxy for funding constraint. Country controls are the same as used in Table 4.3. Models (1) and (2) pertain to market integration, and Models (3) and (4) show the role of funding constraint. Appendix Table 4A provides definitions of variables.

	(1)	(2)	(3)	(4)
Variables	**Market Integration**		**Funding Constraint**	
Home_EPU	0.266***	0.081**	0.270***	0.084*
	(10.728)	(2.264)	(10.071)	(1.873)
Trade Openness	-0.008	-1.077***		
	(-0.086)	(-6.048)		
Home_EPU*Trade Openness		0.265***		
		(7.151)		
Short-term Interest Rate			0.012***	-0.001
			(3.782)	(-0.030)
Home_EPU*Short-term Interest Rate				0.010**
				(2.000)
Market Volatility	0.264***	0.263***	0.311***	0.251***
	(12.414)	(12.430)	(13.947)	(8.804)
Market Return	-0.005***	-0.005***	-0.003*	-0.003
	(-2.734)	(-2.856)	(-1.724)	(-1.180)
# Unique Stocks	-0.345	-0.357	-0.352*	-0.288***
	(-1.296)	(-1.327)	(-1.697)	(-8.250)
Geog. Area	0.022	0.053	0.029	0.011
	(0.170)	(0.400)	(0.286)	(0.621)
GDP Growth Volatility	0.042	0.006	0.029	0.063*
	(0.148)	(0.022)	(0.132)	(1.736)
Constant	-0.900	-0.390	-1.058	-0.845**
	(-0.345)	(-0.148)	(-0.523)	(-2.195)
Time F.E.	Yes	Yes	Yes	Yes
Country F.E.	No	No	No	No
Observations	6,241	6,241	5,151	5,151
# Countries	24	24	24	24

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.4 Panel C: Impact of Governance on EPU- Market Liquidity Relationship

This table reports the empirical results using panel regression for H_a4 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for governance and its interaction term with *Home_EPU*. Country controls are the same as used in Table 4.3. Models (1) and (2) use *World Gov. Index* as a proxy of governance and its interaction term with *Home_EPU*. Models (3) and (4) use *Political Stability* as a proxy of governance and its interaction term with *Home_EPU*. Models (5) and (6) use *Govt. Effectiveness* as a proxy of governance and its interaction term with *Home_EPU*. Appendix Table 4A provides descriptions of variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables			**Governance**			
Home_EPU	0.315***	0.297***	0.324***	0.315***	0.296***	0.336***
	(12.718)	(9.820)	(12.637)	(12.068)	(11.600)	(9.655)
World Gov. Index	-0.440***	-0.462***				
	(-25.720)	(-17.674)				
Home_EPU*World Gov. Index		0.005				
		(1.070)				
Political Stability			-0.804***	-1.056***		
			(-16.108)	(-8.099)		
Home_EPU*Political Stability				0.057**		
				(2.093)		
Govt. Effectiveness					-1.268***	-1.068***
					(-18.477)	(-7.826)
Home_EPU*Govt. Effectiveness						-0.047*
						(-1.691)
Market Volatility	0.282***	0.279***	0.287***	0.284***	0.264***	0.268***
	(12.926)	(12.722)	(12.718)	(12.542)	(11.740)	(11.853)
Market Return	-0.003*	-0.003*	-0.003	-0.003	-0.004*	-0.003*
	(-1.833)	(-1.877)	(-1.376)	(-1.458)	(-1.927)	(-1.862)
# Unique Stocks	0.466*	0.464	-0.075	-0.079	0.089	0.095
	(1.677)	(1.613)	(-0.271)	(-0.274)	(0.323)	(0.334)
Geog. Area	-0.473***	-0.471***	-0.145	-0.142	-0.239*	-0.240*
	(-3.486)	(-3.350)	(-1.077)	(-1.015)	(-1.781)	(-1.732)
GDP Growth Volatility	-0.039	-0.038	0.139	0.139	0.019	0.020
	(-0.133)	(-0.126)	(0.480)	(0.459)	(0.067)	(0.066)
Constant	2.009	2.082	-0.877	-0.834	0.681	0.485
	(0.747)	(0.746)	(-0.328)	(-0.299)	(0.256)	(0.176)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	No	No	No	No	No	No
Observations	5,521	5,521	5,521	5,521	5,521	5,521
# Countries	24	24	24	24	24	24

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.4 Panel D: Impact of Financial Development, Market Integration, Funding Constraints, and Governance on EPU- Market Liquidity Relationship

This panel reports the empirical results using panel regression for hypotheses 1 through 4 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and a combination of different proxies of financial development, market integration, funding constraints, and governance and their interaction term with *Home_EPU*. Country controls are the same as used in Table 4.3. Appendix Table 4A provides definitions of variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Home_EPU	0.158***	0.427***	0.161***	0.483***	0.246***	0.256**
	(3.899)	(3.518)	(3.945)	(4.191)	(5.683)	(2.108)
GDP Growth	0.131***		0.116***		0.151***	
	(3.827)		(3.249)		(4.306)	
Home_EPU*GDP Growth	-0.041***		-0.041***		-0.047***	
	(-5.579)		(-5.382)		(-6.329)	
Financial Development Index		1.651		0.174		-2.870***
		(1.594)		(0.212)		(-2.740)
Home_EPU*Financial Development Index		-0.529**		-0.485***		0.331
		(-2.490)		(-2.947)		(1.560)
Trade Openness	-1.811***	-1.445***	-1.577***	-1.228***	-1.506***	-1.491***
	(-8.281)	(-5.990)	(-6.706)	(-4.795)	(-6.631)	(-5.713)
Home_EPU*Trade Openness	0.388***	0.223***	0.357***	0.158***	0.393***	0.248***
	(9.243)	(4.777)	(7.837)	(3.189)	(8.973)	(4.906)
World Gov. Index	-0.407***	-0.553***				
	(-15.191)	(-12.149)				
Home_EPU*World Gov. Index	-0.009**	0.006				
	(-1.960)	(0.614)				
Political Stability			-0.581***	-1.126***		-1.776***
			(-4.101)	(-5.627)		(-7.556)
Home_EPU*Political Stability			-0.042	0.048		0.257***
			(-1.409)	(1.133)		(5.111)
Govt. Effectiveness					-0.588***	1.057***
					(-4.130)	(3.432)
Home_EPU*Govt. Effectiveness					-0.146***	-0.487***
					(-4.865)	(-7.269)

Table 4.4 Panel D: Impact of Financial Development, Market Integration, Funding Constraints, and Governance on EPU- Market Liquidity Relationship (Cont.)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Market Volatility	0.267***	0.289***	0.261***	0.284***	0.251***	0.270***
	(12.416)	(13.036)	(11.801)	(12.238)	(11.353)	(11.878)
Market Return	-6.325	-4.760	0.682	4.563	-10.048**	-7.222
	(-1.444)	(-1.039)	(0.151)	(0.958)	(-2.217)	(-1.518)
# Unique Stocks	5.554	3.514	-2.848	-7.719	10.694*	6.931
	(1.017)	(0.615)	(-0.505)	(-1.300)	(1.893)	(1.169)
Geog. Area	8.542	4.960	-6.726	-15.489	17.823*	11.105
	(0.868)	(0.482)	(-0.662)	(-1.447)	(1.750)	(1.039)
GDP Growth Volatility	-0.003	-0.003*	-0.002	-0.003	-0.003	-0.003
	(-1.627)	(-1.749)	(-1.151)	(-1.342)	(-1.584)	(-1.593)
Constant	-41.101	-18.258	45.019	98.603	-103.108*	-58.941
	(-0.690)	(-0.292)	(0.731)	(1.519)	(-1.671)	(-0.909)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,509	5,008	5,509	5,008	5,509	5,008
# Countries	24	23	24	23	24	23

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.5: Robustness Checks

This table presents the empirical results for the baseline regression using stock market liquidity as the dependent variable. In Columns (1), (2), (5), and (6) I estimate the following model: $LIQi,t = \alpha+\beta Home\_EPUi,t +\lambda US\_EPU + \gamma\ Macro\_Controlsi,t + \epsilon i,t$, where *LIQi,t* is stock market illiquidity (liquidity) using Amihud's illiquidity measure (Columns (1), (2), (3), and (4)) and modified liquidity measure following Karolyi et al. (2012)(Columns (5), (6), (7), and (8) for country *i* in month *t*. *Home_EPUi,t* is the natural log of the domestic economic policy uncertainty index (EPU index) for country *i* in month *t*. *US_EPU* is the natural log of the U.S economic policy uncertainty index (EPU index) in month *t*, and *Macro_Controlsi,t* represents various explanatory variables at country level, which are *Market Volatility*, *Market Return*, *# Unique Stocks*, *Geog. Area* and *GDP Growth Volatility*. In Columns (3), (4), (7), and (8) I estimate the following model: $LIQi,t = \alpha+\beta Residual\ Home\_EPUi,t + \gamma\ Macro\_Controlsi,t + \epsilon i,t$. *Residual Home_EPUi,t* is the residual from a regression of *Home_EPU* on *US_EPU* for country *i* in month *t*. Appendix Table 4A provides definitions of variables and their calculation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ami_Illiquidity		*Ami_Illiquidity*		*Modified Liquidity*		*Modified Liquidity*	
Variables	***Equally Weighted Market Illiquidity***	***Value Weighted Market Illiquidity***	***Equally Weighted Market Illiquidity***	***Value Weighted Market Illiquidity***	***Equally Weighted Market Liquidity***	***Value Weighted Market Liquidity***	***Equally Weighted Market Liquidity***	***Value Weighted Market Liquidity***
Home_EPU	0.407***	0.249***			-0.232***	-0.007***		
	(11.631)	(9.779)			(-3.432)	(-6.395)		
US_EPU	0.038	0.135***			0.090	0.000		
	(0.610)	(2.954)			(0.745)	(0.103)		
Residual Home_EPU			0.384***	0.228***			-0.244***	-0.007***
			(10.837)	(8.822)			(-3.548)	(-6.264)
Market Volatility	0.168***	0.251***	0.196***	0.286***	0.055	-0.000	0.058	-0.001
	(5.640)	(11.552)	(6.525)	(13.099)	(0.961)	(-0.404)	(1.002)	(-0.842)
Market Return	-0.004*	-0.005***	-0.005*	-0.005***	0.006	0.000	0.006	0.000
	(-1.659)	(-2.682)	(-1.896)	(-2.862)	(1.321)	(0.947)	(1.358)	(1.088)
# Unique Stocks	1.124	-2.610	0.229	-0.130	32.018***	0.451***	-0.185	-0.007
	(0.216)	(-0.689)	(0.683)	(-0.432)	(3.188)	(2.903)	(-0.567)	(-0.735)
Geog. Area	-2.345	1.600	-0.152	0.050	-39.761***	-0.558***	-0.017	-0.002
	(-0.362)	(0.339)	(-1.038)	(0.376)	(-3.179)	(-2.882)	(-0.117)	(-0.514)
GDP Growth Volatility	-5.302	1.358	-0.317	0.097	-71.598***	-0.996***	0.115	0.000
	(-0.454)	(0.159)	(-0.998)	(0.341)	(-3.174)	(-2.854)	(0.373)	(0.011)
Constant	32.885	-7.922	1.886	-1.714	433.022***	6.049***	0.518	0.044
	(0.466)	(-0.154)	(0.588)	(-0.595)	(3.176)	(2.866)	(0.166)	(0.513)
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,253	6,253	5,977	5,977	6,253	6,253	5,977	5,977
# Countries	24	24	23	23	24	24	23	23

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.6 Panel A: Impact of Financial Development on EPU- Liquidity Relationship Using Residual EPU

This table reports the empirical results using panel regression for H_a1 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for financial development at a time along with their interaction term with Home_EPU. Country controls are the same as used in Table 4.3. Models (1) and (2) use *GDP Growth* as a proxy of financial development and its interaction with *Residual Home_EPU*. Models (3) and (4) use *Financial Development Index* as a proxy of financial development its interaction with *Residual Home_EPU*. Models (5) and (6) use *Financial Efficiency Index* as a proxy of financial development its interaction with *Residual Home_EPU*. Appendix Table 4A provides definitions of variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables			**Financial Development**			
Residual Home_EPU	0.184***	0.228***	0.218***	0.558***	0.211***	0.431***
	(7.253)	(6.658)	(8.116)	(6.383)	(7.859)	(7.954)
GDP Growth	-0.085***	-0.085***				
	(-17.240)	(-17.305)				
Residual Home_EPU* GDP Growth		-0.015*				
		(-1.918)				
Financial Development Index			-2.475***	-2.524***		
			(-8.047)	(-8.255)		
Residual Home_EPU* Financial Development Index				-0.569***		
				(-4.093)		
Financial Efficiency Index					0.590***	0.610***
					(6.685)	(6.926)
Residual Home_EPU* Financial Efficiency Index						-0.380***
						(-4.673)
Market Volatility	0.265***	0.265***	0.260***	0.266***	0.266***	0.270***
	(12.383)	(12.388)	(11.683)	(11.924)	(11.942)	(12.151)
Market Return	-0.004**	-0.004**	-0.006***	-0.006***	-0.005***	-0.005***
	(-2.442)	(-2.468)	(-3.182)	(-3.088)	(-2.913)	(-2.937)
# Unique Stocks	-0.112	-0.113	0.163	0.173	-0.247	-0.251
	(-0.469)	(-0.481)	(0.658)	(0.779)	(-0.924)	(-0.915)
Geog. Area	0.047	0.047	-0.022	-0.022	0.059	0.059
	(0.450)	(0.453)	(-0.205)	(-0.231)	(0.511)	(0.493)
GDP Growth Volatility	0.148	0.147	0.146	0.146	0.097	0.093
	(0.655)	(0.660)	(0.627)	(0.706)	(0.385)	(0.359)
Constant	-1.586	-1.569	-1.518	-1.570	-1.186	-1.155
	(-0.695)	(-0.696)	(-0.649)	(-0.753)	(-0.467)	(-0.442)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	No	No	No	No	No	No
Observations	5,977	5,977	5,440	5,440	5,440	5,440
# Countries	23	23	22	22	22	22

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.6 Panel B: Impact of Market Integration and Funding Constraints on EPU- Liquidity Relationship Using Residual EPU

This table reports the empirical results using panel regression for H_a2 and H_a3 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and *Trade Openness* as a proxy for market integration and *Short-term Interest Rate* as a proxy for funding constraint. Country controls are the same as used in Table 4.3. Models (1) and (2) pertain to market integration, and Models (3) and (4) show the role of funding constraint. Appendix Table 4A provides definitions of variables.

	(1)	(2)	(3)	(4)
Variables	**Market Integration**		**Funding Constraint**	
Residual Home_EPU	0.224***	0.025	0.153***	0.115***
	(8.603)	(0.561)	(5.290)	(3.095)
Trade Openness	-0.066	0.048		
	(-0.669)	(0.472)		
Residual Home_EPU*Trade Openness		0.285***		
		(5.342)		
Short-term Interest Rate			0.030***	0.031***
			(9.951)	(10.057)
Residual Home_EPU*Short-term Interest Rate				0.007*
				(1.658)
Market Volatility	0.286***	0.287***	0.412***	0.413***
	(13.092)	(13.177)	(18.191)	(18.252)
Market Return	-0.005***	-0.005***	0.000	0.000
	(-2.837)	(-2.979)	(0.174)	(0.175)
# Unique Stocks	-0.122	-0.134	1.567***	1.570***
	(-0.393)	(-0.417)	(11.641)	(11.660)
Geog. Area	0.032	0.056	-0.821***	-0.823***
	(0.232)	(0.395)	(-13.834)	(-13.861)
GDP Growth Volatility	0.109	0.081	-1.741***	-1.743***
	(0.369)	(0.268)	(-13.322)	(-13.340)
Constant	-1.528	-1.769	0.082	0.072
	(-0.511)	(-0.575)	(0.041)	(0.039)
Time Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	No	No	No	No
Observations	5,965	5,965	4,889	4,889
# Countries	23	23	23	23

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

Table 4.6 Panel C: Impact of Governance on EPU- Liquidity Relationship Using Residual EPU

This table reports the empirical results using panel regression for H_a4 using Amihud's illiquidity measure (*Ami_illiquidity*) as the dependent variable and one proxy for governance and its interaction term with *Residual Home_EPU*. Country controls are the same as used in Table 4.3. Models (1) and (2) use *World Gov. Index* as a proxy of governance and its interaction term with *Home_EPU*. Models (3) and (4) use *Political Stability* as a proxy of governance and its interaction term with *Residual Home_EPU*. Models (5) and (6) use *Govt. Effectiveness* as a proxy of governance and its interaction term with *Residual Home_EPU*. Appendix Table 4A provides descriptions of variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Governance**					
Residual Home_EPU	0.273***	0.317***	0.286***	0.292***	0.249***	0.359***
	(10.545)	(10.107)	(10.641)	(10.754)	(9.303)	(9.773)
World Gov. Index	-0.457***	-0.459***				
	(-26.236)	(-26.329)				
Residual Home_EPU*World Gov. Index		-0.013**				
		(-2.490)				
Political Stability			-0.861***	-0.863***		
			(-16.458)	(-16.495)		
Residual Home_EPU*Political Stability				-0.047		
				(-1.520)		
Govt. Effectiveness					-1.298***	-1.337***
					(-18.525)	(-18.959)
Residual Home_EPU*Govt. Effectiveness						-0.143***
						(-4.374)
Market Volatility	0.309***	0.312***	0.314***	0.316***	0.288***	0.292***
	(13.758)	(13.893)	(13.502)	(13.555)	(12.400)	(12.606)
Market Return	-0.004**	-0.004*	-0.003	-0.003	-0.004**	-0.004*
	(-1.978)	(-1.903)	(-1.593)	(-1.547)	(-2.061)	(-1.950)
# Unique Stocks	0.694**	0.699**	0.182	0.183	0.305	0.322
	(2.380)	(2.370)	(0.644)	(0.631)	(1.061)	(1.110)
Geog. Area	-0.477***	-0.478***	-0.133	-0.132	-0.227*	-0.234*
	(-3.713)	(-3.681)	(-1.069)	(-1.038)	(-1.799)	(-1.840)
GDP Growth Volatility	0.007	0.007	0.208	0.208	0.072	0.071
	(0.027)	(0.024)	(0.774)	(0.757)	(0.264)	(0.260)
Constant	1.845	1.833	-1.486	-1.501	0.267	0.282
	(0.664)	(0.653)	(-0.549)	(-0.543)	(0.097)	(0.102)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	No	No	No	No	No	No
Observations	5,281	5,281	5,281	5,281	5,281	5,281
# Countries	23	23	23	23	23	23

t-stat in parentheses
*** p<0.01, ** p<0.05, * p<0.10

APPENDIX

Appendix Table 4A: Descriptions of Variables

This table defines all the variables used in the paper, along with their data source.

Home_EPU	Natural log of Economic Policy Uncertainty Index by Baker, Bloom, and Davis (2016) (EPU index)	https://www.policyuncertainty.com/all_country_data.html
US_EPU	Natural log of the U.S. Economic Policy Uncertainty Index by Baker, Bloom, and Davis (2016) (EPU index)	https://www.policyuncertainty.com/all_country_data.html
Ami Illiquidity	Amihud's illiquidity measure calculated following Amihud (2002)	Own computations using data from Datastream and CRSP
Modified LIQ	The modified measure of Liquidity calculated following Karoyli (2012)	Own computations using data from Datastream and CRSP
Residual Home_EPU	Residual from regression of *Home_EPU* on *US-EPU* to get that part of *Home_EPU*, which the US_EPU does not explain	Own Computations
GDP Growth	GDP growth (annual %)	WDI Indicators of World Bank
Financial Development Index	Value of Financial Development index (FD). It is a country-based index that provides relative ranking to the countries based on the depth, access, and efficiency of their financial markets and institutions.	Financial Development Index database of IMF
Financial Efficiency Index	Value of Financial Market Efficiency index (FME). This index provides ranking to the countries based on the stock market turnover ratio. It is calculated as a ratio of stocks traded to market capitalization.	Financial Development Index database of IMF
Short-term Interest Rate	Following Karolyi et al. 2012, I use the short-term Treasury Bill rate (3-months) for the countries in the sample. If this rate is not available, I use the money market rate.	Datastream
Trade Openness	Calculated as (Exports+Imports)/GDP	WDI Indicators of World Bank

World Gov. Index	The sum of all the six dimensions of Worldwide Governance Indicators (WGI) of World Bank.	Own Computations using WGI data of World Bank (Kaufmann et al. (2010)
Political Stability	Value of '*Political Stability and Absence of Violence*' dimension of WGI for all the countries in the sample.	WGI data of World Bank (Kaufmann et al. (2010)
Govt. Effectiveness	Value of '*Government Effectiveness*' dimension of WGI for all the countries in the sample.	WGI data of World Bank (Kaufmann et al. (2010)
Market Volatility	The volatility of value-weighted market returns calculated as the standard deviation of daily stock returns in month t	Own computations using data from Datastream and CRSP
Market Return	Value-weighted market returns are calculated based on daily returns and compounded over the month.	Own computations using data from Datastream and CRSP
# Unique Stocks	Natural log of the total number of shares for each country in the sample.	Datastream (Table 4.1 Panel C)
GDP Per Capita	Natural log of GDP per capita in US$	WDI Indicators of World Bank
Geog. Area	Natural log of the land area of the countries in square kilometers.	WDI Indicators of World Bank
Inflation	Inflation, GDP deflator (annual %)	WDI Indicators of World Bank
GDP Growth Volatility	Following Morck et al. (2000) and Karolyi et al. (2012), the standard deviation of each country's GDP in the sample period (1997-2019)	Own computations using data from WDI Indicators of World Bank

CHAPTER 5

CONCLUSIONS

Across the three essays of my dissertation, I document a negative impact of economic policy uncertainty on liquidity in the global context. In the first essay, using extensive international data comprised of developed and emerging countries from 1997 through 2019, I find that firm-level informational transparency helps mitigate the negative impact of EPU on stock liquidity. Amid heightened uncertainty, market makers and investors valuable information rather than the quality of that information while supplying liquidity.

In the second essay, using a sample of non-U.S. stocks cross-listed in the U.S., I document that cross-listing helps mitigate the negative impact of domestic and U.S. economic policy uncertainty on domestic liquidity. These results are more pronounced for developed and strong governance countries. The findings of my study support the information disclosure hypothesis for developed and strong governance countries, whereas for emerging and weak governance countries, market opaqueness dominates firm-level information disclosure.

In the third essay, examining the impact of EPU on stock market liquidity, I find that the financial development of a country and its governance mechanism help mitigate EPU's negative effect on stock market liquidity. However, market integration, as captured through trade openness and political stability, worsens the impact. My results are robust to the use of different measures of liquidity and the expected confounding effect of other sources of uncertainty.

Overall, my study suggests that policymakers should ensure stable economic policies while improving the governance mechanism and information environment to ensure better liquidity.

Corporate managers can also win investors' confidence and deal with macro-level information asymmetries by keeping the firms transparent.