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Two Essays on International Capital Flows and Cross-Listings

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TWO ESSAYS ON INTERNATIONAL CAPITAL FLOWS AND CROSS-LISTINGS

A Dissertation

by

LU SUI

Submitted to the Graduate College of
The University of Texas Rio Grande Valley
In partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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TWO ESSAYS ON INTERNATIONAL CAPITAL FLOWS AND CROSS-LISTINGS

A Dissertation
by
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December 2017

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ABSTRACT

Lu, Sui, Two Essays on International Capital Flows and Cross-listings. Doctor of Philosophy (PhD), December 2017, 108 pp., 14 tables, 11 figures, references, 55 titles.

This dissertation explores two interesting issues: international capital flows and cross-listings. With high volatility of capital flows and imbalance of capital flows between emerging and advanced economies, the topic of capital flow management is always attractive to researchers and policy makers. The first essay explore how capital flows in G20 countries are significantly impacted by pull and push factors. The results show that international capital flows are significantly associated with domestic financial development, which is measured by stock market liquidity and domestic credit. Moreover, international capital flows are affected by some push factors such as, the growth of world economy and fluctuations of crude oil price. Finally, this study controls for real interest rate, foreign currency, and capital restriction because government and macroprudential policies are key to stabilizing capital flows.

The second essay addresses two research questions: 1) how cross-listing activities are associated with domestic financial development, and 2) why do firms choose different types of DRs? The first section shows a threshold effect of financial development on country's demands

for DRs. When financial development is at a much lower stage, some countries have no explicit demands for cross-listing; when local stock markets become well-developed, most countries have great demands for cross-listings; however, after local stock market develop at very strong level, domestic financial development has less influence on demands of cross-listings. The second section shows difference in abnormal returns of domestic shares because of different choices of DRs. In the event study, the results show that developed countries earn positive abnormal returns around the ADR and GDR listing, but developing countries earn negative abnormal returns around GDR listing. Level I and unsponsored DRs bring positive abnormal returns to domestic shares, but Level II&III DRs come with some negative abnormal returns. And then, it explains that how choices of DRs are affected by domestic financial development, and it also controls for domestic disclosure index, political stability, cultural distance, and firm characteristics. Countries with lower financial development, worse disclosure requirements, political instability, and cultural similarity, are more likely to issue GDRs, Level II&III DRs, and sponsored DRs, which is consistent with the bonding and proximity hypotheses.

DEDICATION

I dedicate this dissertation to my family, a forever source of love, strength and support. A special gratitude to my parents, Sui Zhiyong and Xu Rong, for their unconditional love, support, and encouragement. I also dedicate this dissertation to my friends who have been supporting me in my life and incensing me to strive towards my goal.

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TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
DEDICATION.....	v
ACKNOWLEDGMENTS	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
CHAPTER I. INTRODUCTION.....	1
General Background	1
Purposes of the Study.....	20
CHAPTER II. DRIVERS OF CAPITAL FLOWS: EVIDENCE FROM G20 COUNTRIES	23
Introduction.....	23
Literature Review.....	25
Hypothesis Development.....	30
Data.....	31
Methodology.....	32
Results.....	36
Conclusions and Implications.....	53
CHAPTER III. COUNTRY DEMANDS AND FIRM CHOICES FOR CROSS-LISTING	59
Introduction	59
Literature Review and Hypothesis Development	61
Data.....	65

Methodology	67
Results	72
Conclusions.....	91
CHAPTER IV. CONCLUDING REMARKS	93
REFERENCES	96
BIOGRAPHICAL SKETCH	108

LIST OF TABLES

	Page
Table 2.1a: Descriptive Statistics in 11 Emerging Countries	44
Table 2.1b: Descriptive Statistics in 8 Developed Countries	45
Table 2.2: Correlation Matrix	46
Table 2.3a: Granger Causality	48
Table 2.3b: FEVD.....	49
Table 2.4: Results of GMM Regressions in G20 Countries	54
Table 2.5a: Regression Analysis in Eight Developed Countries	55
Table 2.5b: Regression Analysis in Eleven Emerging Countries	56
Table 3.1a: Descriptive Statistics in 21 Developed Countries.....	76
Table 3.1b: Descriptive Statistics in 15 Emerging Countries	77
Table 3.2: Threshold Estimates and Tests for Threshold Effects	81
Table 3.3: Regression Results of Country Demands of ADRs.....	83
Table 3.4: Cumulative Average Abnormal Return (CAAR)	87
Table 3.5: Logistic Regression Results of Firm Choices of DRs	90

LIST OF FIGURES

	Page
Figure 1.1: GDP Growth and Capital Flows between Emerging and Advanced Economies.....	7
Figure 1.2: The Trends of DRs	10
Figure 1.3: ADRs by Zone and Countries	12
Figure 1.4: ADRs by Country Classification	13
Figure 1.5: ADRs by Industries	14
Figure 2.1: The Capital Flows of G20	38
Figure 2.2: World Trends.....	40
Figure 2.3: Capital Flows between US and Five Regions	41
Figure 3.1: The Trends of All Types of DRs	75
Figure 3.2: Confidence Interval Construction in the Threshold Model.....	80
Figure 3.3: Abnormal Returns	86

CHAPTER I

INTRODUCTION

General Background

Essay 1: International Capital Flows

In the early twentieth century, capital flows primarily appeared among advanced economies. Since the 1970s, a large number of capital flows have moved from developed countries to emerging countries. According to neoclassical growth theory, capital flows should move from rich countries with the relatively high capital-to-labor ratio (K/L) to poor countries with relatively low K/L ratios, due to the effect of diminishing returns of capital. However, some studies offer different perspectives and show that capital flows do not always move from rich to poor nations based on reviews by Lucas (1990) and Gourinchas & Jeanne (2013). Afterwards, a number of studies began to explore determinants of international capital flows by applying two main frameworks: push-pull and cyclical-structural drivers.

The Investment Development Path Hypothesis

Dunning (1981) proposes the investment development path (IDP) in five stages based on two premises: 1) economic development implicitly involves a succession of structural changes and 2) these changes entail a dynamic relationship between the type and volume of FDI that a country sends and receives. The first stage of the IDP refers to no capital flows in the least developed countries, which have limited domestic markets, the lowest quality of workforce, inappropriate

infrastructure, and political instability. As a result, both capital inwards and outwards are extremely limited and multinational firms access these countries through trade. The second stage refers that an improvement of locational advantages leads to a growth of FDI inwards, while FDI outwards remains negligible. The third stage indicates that emerging countries are beginning to make investment abroad, but still remain net receiver of FDI. Main foreign investors in the fourth stage come from countries with identical development levels, whose FDI flows are mainly oriented towards rationalization projects and the seeking of strategic assets. However, some FDI inwards come from countries at a lower stage of development, which is likely to be a market-seeking, trade-related, and asset seeking nature. The fifth stage refers both highest FDI inwards and outwards in the advanced countries. As a result, advanced countries' FDI inwards and outwards do not depend on the characteristics of the home and host countries, but depend on its endowment of created assets and technological and organizational capacities of each country.

Push and Pull Drivers of Capital Flows

Push factors indicate external effects on international capital flows. For example, in the 1990s, the falling interest rates in the U.S. led to global capital flows from the U.S. to high-yield emerging economies, such as Asia, Latin America, and Middle-East (Calvo, Leiderman, & Reinhart, 1993, 1996; Baek, 2006). During the financial crisis in 2008-2009, foreign investors and agents became risk-averse and reduced capital outflows (Fratzscher, 2012; Broner, Didier, Erce, & Schmukler, 2013). On the other hand, some studies show that domestic cost of capital is significantly associated with international equity flows in the emerging countries (Bekaert & Harvey, 1998; Froot, O'Connell, & Seasholes, 2001). Kim and Wu (2008) show that the better sovereign credit ratings on domestic debt tend to attract capital flows. Some studies show that both domestic stock-market development and private credit have a positive association with

domestic firms investing abroad (Claessens, Klingebiel, & Schmukler, 2006). Thus, both pull and push factors significantly influence capital inwards and outwards.

Cyclical and structural drivers of capital flows are complementary of the push-pull framework (Koepke, 2015). Cyclical drivers indicate short-term fluctuations in the business cycle, such as financial crisis, GDP growth, and interest rates. Structural drivers indicate the fundamental structure of an economy, its institutional quality, and its legal and policy system. A number of studies argue that domestic institution quality has a substantial impact on international flows (Papaioannou, 2009; Ju & Wei, 2010). Some studies show that liberalizing capital controls (or financial openness) in emerging countries accelerates capital flows from rich to poor countries (Edison & Warnock, 2008; Binici, Hutchison, & Schindler, 2010; Reinhardt, Ricci, & Tressel, 2013). However, Okada (2013) shows that financial openness and institutional quality do not individually impact on capital flows, but their interaction effect is significantly related to capital flows.

Monetary and Macprudential Policies

Monetary policies are used to stabilize inflation and employment rate in normal times, but in crisis times, the instruments of monetary policy are larger and include balance-sheet policies, such as asset purchase (quantitative easing) and foreign exchange interventions. In most countries, monetary policies only affect domestic capital markets, but the U.S. monetary have significantly spillover effects on global capital markets. A number of previous studies have shown the U.S. interest rate influence capital flows between the U.S. and emerging countries. However, since the 2007-2009 global financial crisis, the Federal Reserve repeatedly engaged in unconventional monetary policy such as large-scale asset purchases. The recent studies show that

the U.S. unconventional monetary policy shocks significantly increase portfolio flows from the U.S. to emerging countries (Ahmed & Zlate, 2014; Anaya, Hachula, & Offermanns, 2017).

In the history, there has been a lot of debate among scholars about the appropriateness of macroprudential policies. Some studies show that macroprudential policies such as capital controls and currency reserve requirements, can distort the global allocation of capital by shifting flows to other countries, and aid nations in maintaining competitiveness against their trading partners by resisting appreciation pressures (Pasricha, 2012). However, macroprudential policies are adopted to safeguard financial stability, in particular to deal with the credit and asset price cycles driven by global capital flows (Zhang & Zoli, 2016). Some studies find that both capital controls and foreign exchange related prudential measures are related to a lower proportion of foreign currency lending in total domestic bank credit, and with a lower portion of portfolio debt in total external liabilities (Ostry, Ghosh, Chamon, & Qureshi, 2012). Bruno and Shin (2014) show that Korea became less sensitive to push factors after the introduction of its macroprudential policies after June 2010.

After 2007-2009 global financial crisis, the IMF revised its long-standing opposition to capital controls and began to discuss the efficient capital flow management (Kevin P. Gallagher & Tian, 2017). Given financial integration, cross-border spillover may arise because some countries are using macroprudential policies but others are not using them or when a financial cycle is in an upswing in a country but in a downswing in another (Claessens, 2015). According to IMF policy paper, international cooperation and coordination of financial policies to address multilateral risks and policy spillovers that can impact cross-border capital flows. Cooperation among macroprudential authorities may also help to address cross-border sources of systemic risk (IMF, 2016). On the contrary, policy coordination is hard to implement in practice. Ostry

and Ghosh (2016) show three roadblocks of coordination: 1) policymakers tend to focus excessively on a narrow set of objectives, 2) disagreements seem to be a primary obstacle to agreeing on a set of coordinated policies since different countries in the global economy perceive policy transmissions variously, and 3) some countries may benefit from coordination of policies greatly exceeds other participants in coordination agreements.

Multinational Enterprises' Strategies

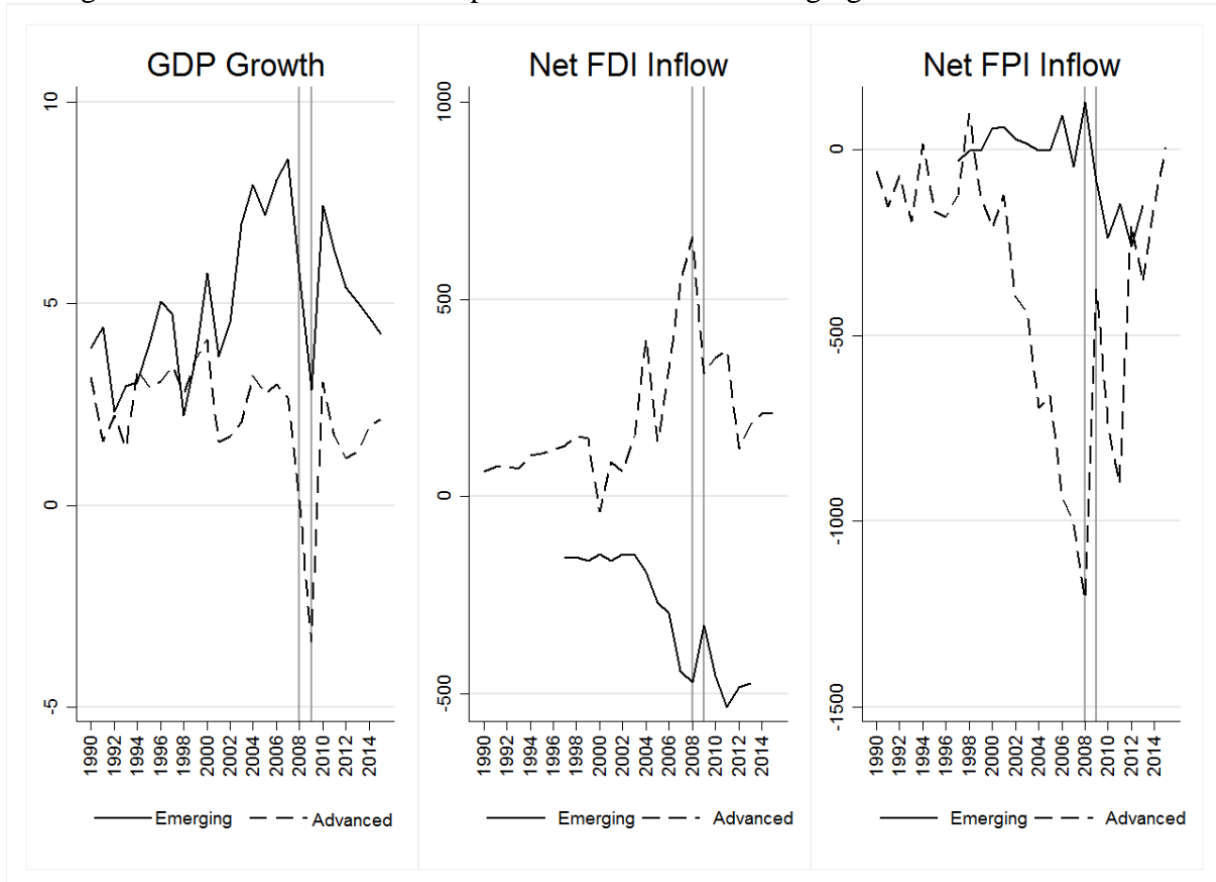
The drivers of cross-border capital flows not only incorporate macro factors and policies, but also include some micro factors, such as firms' strategies of resource seeking, market seeking, efficiency seeking and knowledge seeking, and these interact with the stage of economic development of countries (J. H. Dunning, 2006; Álvarez & Marín, 2010). Moreover, Helpman, Melitz, and Yeaple (2004) show that productivity at the firm level drives microeconomic decisions on cross-border investments based on heterogeneous firm models. In addition, some studies argue that multinational corporations have various incentives on the choice of FDI mode among Greenfield direct investment and cross-border M&A, and FDI inflows have different impacts on the host countries depending on the types of FDI (Ashraf, Herzer, & Nunnenkamp, 2016). Based on a traditional view on the welfare impacts of each different types of FDI, Kim (2009) shows that Greenfield FDI is more likely to improve the capital formation and productivity of host countries, but cross-border M&A tends to transfer host country's income to foreign countries.

The Trend of Capital Flows and GDP Growth

Figure 1.1 explores GDP growth based on purchasing power parity (PPP) per capita gross domestic product, net foreign direct investment (FDI) inflows, and net foreign portfolio investment (FPI) inflows between emerging and advanced economies. First, through comparing

GDP growth between emerging and advanced nations, we find that 1) the economic growth of advanced economies was close to that of emerging countries before 2000; 2) from 2000 to 2009, the economic growth of emerging economies was much higher than advanced economies; 3) after 2010, the growth of emerging economies slowed down rapidly. Second, FDI mainly flowed into advanced economies, but emerging countries always suffer negative net FDI inflows. Moreover, the FPI significantly flowed into emerging countries from 1997 to 2009, and it flowed out after 2009. However, a significant amount of FPI (or short investments) flowed out advanced countries from 2000 to 2010, and the FPI flowed back to the advanced economy in recent years. Third, during the 2008-2009 financial crisis, the net FDI significantly decreased in advanced economies, but it increased in emerging countries. By contrast, during the crisis, the net FPI increased in advanced economies and decreased in emerging economies.

Figure 1.1: GDP Growth and Capital Flows between Emerging and Advanced Economies



Sources: The data, the GDP growth, net FDI inflow, and net FPI inflows, are collected from IMF World Economic Outlook.

Essay 2: Cross-listing Activities: ADRs and GDRs

Capital markets across the world are getting increasingly integrated. The capital account has been dominated by flows in the form of FDI, FPI including ADRs/GDRs, external commercial borrowing, and non-resident deposits. The second essay focuses on exploring what factors influence foreign firms and countries' demands of ADRs or GDRs.

DRs Development

In Figure 1.2, the growth of ADRs first jumped up in 1983, since the adoption of Form F-6 allows foreign companies to take action to obtain an exemption under Rule 12g3-2(b). Through 1990 to 2000, ADRs grew rapidly, since international firms have very high demand for raising capital in the U.S. markets. In December 1990, the first Global Depositary Receipt (GDR) was issued to help foreign firms to raise capital in the U.S. (i.e. NYSE and NASDAQ) and Europe (i.e. Luxemburg stock exchange and London stock exchange) through one equity issued simultaneously into both markets. From 2001 to 2002, demands of depositary receipt tended to decrease due to the technology bubble implosion and Sarbanes-Oxley Act (SOX)). From 2003 to 2007, the demands of depositary receipts (i.e. Level I, II, & III ADRs and GDRs in Reg.S and Rule 144) rebounded and grew¹. During this period, the falling U.S. dollar and low-interest rate drove ADRs' prices. Additionally, because international equity markets (BRICS²) outperformed U.S. markets in this period, investors and depositary banks followed BRICs markets.

Due to the new Rule 12g3-2(b) exemption in October 2008, unprecedented volatility of ADRs was driven by the massive supply of unsponsored depositary receipts (UDRs)³. The

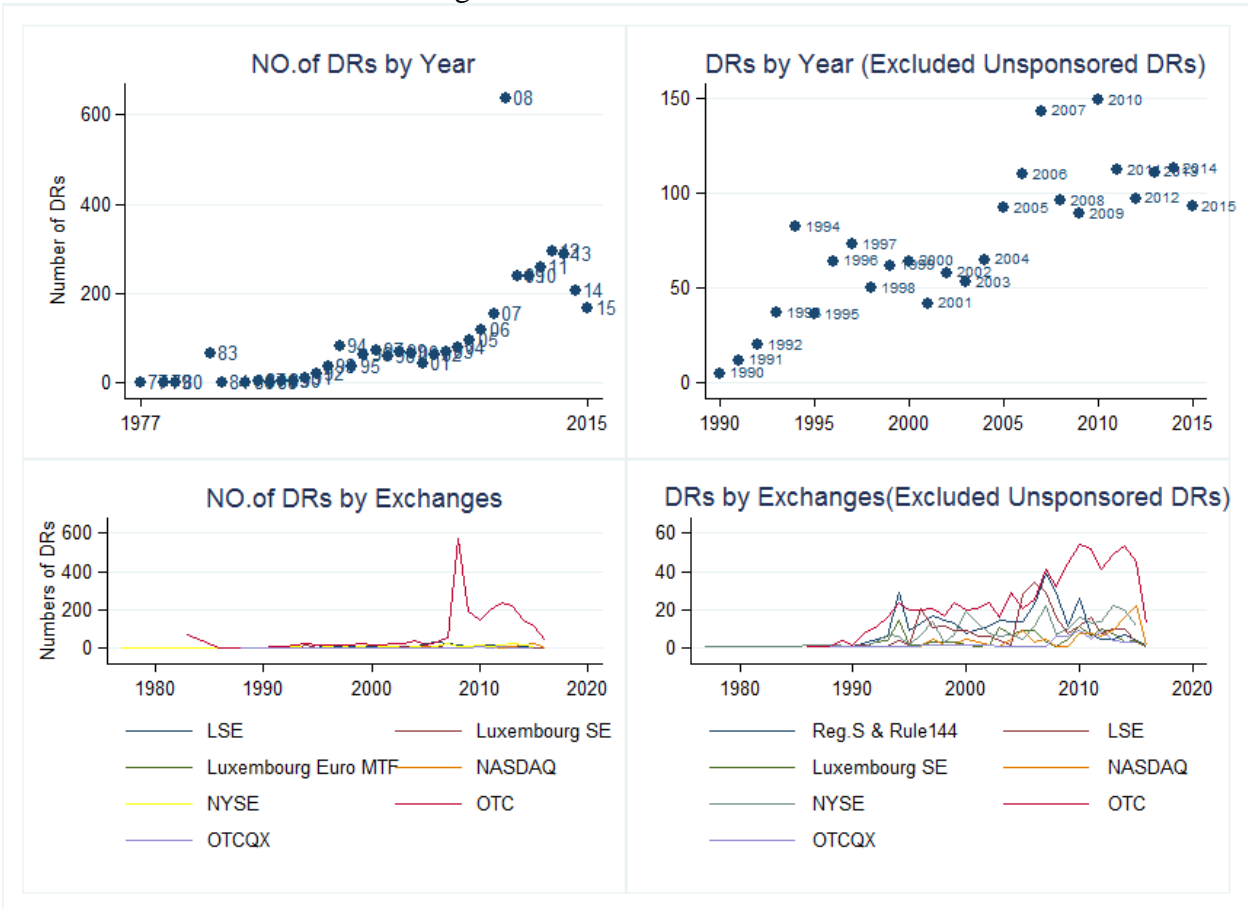
¹ Reg.S permits to sell GDRs to foreign investors outside of the U.S. without registration. Rule 144 permits to sell GDRs to qualified institutional investors in the U.S. without registration.

² The BRICS indicates Brazil, Russia, India, China, and South Africa.

³ The exemption permits foreign issuers to issue unsponsored ADRs in OTC markets without registration under Section 12(g). Also, it does not require the creation of new disclosure documents, but only require the translation into English of disclosure documents in a foreign language.

deregulation of foreign disclosure requirements was designed to continue to attract foreign firms and investors to the U.S. markets. However, the regulation change did not achieve its intention of increasing Level I ADRs in over-the-counter (OTC) markets by a reduction in compliance costs, and it motivated depositary banks to create more UDRs for increasing banks' expected fee revenue (Iliev, Miller, & Roth, 2014). The number of unsponsored ADRs rose ten times in 2008 more than those in 2007. From 2009 to 2013, the growth of sponsored depositary receipts (SDRs) increased, but the growth of unsponsored DRs appeared to slow down.

Figure 1.2: The Trends of DRs

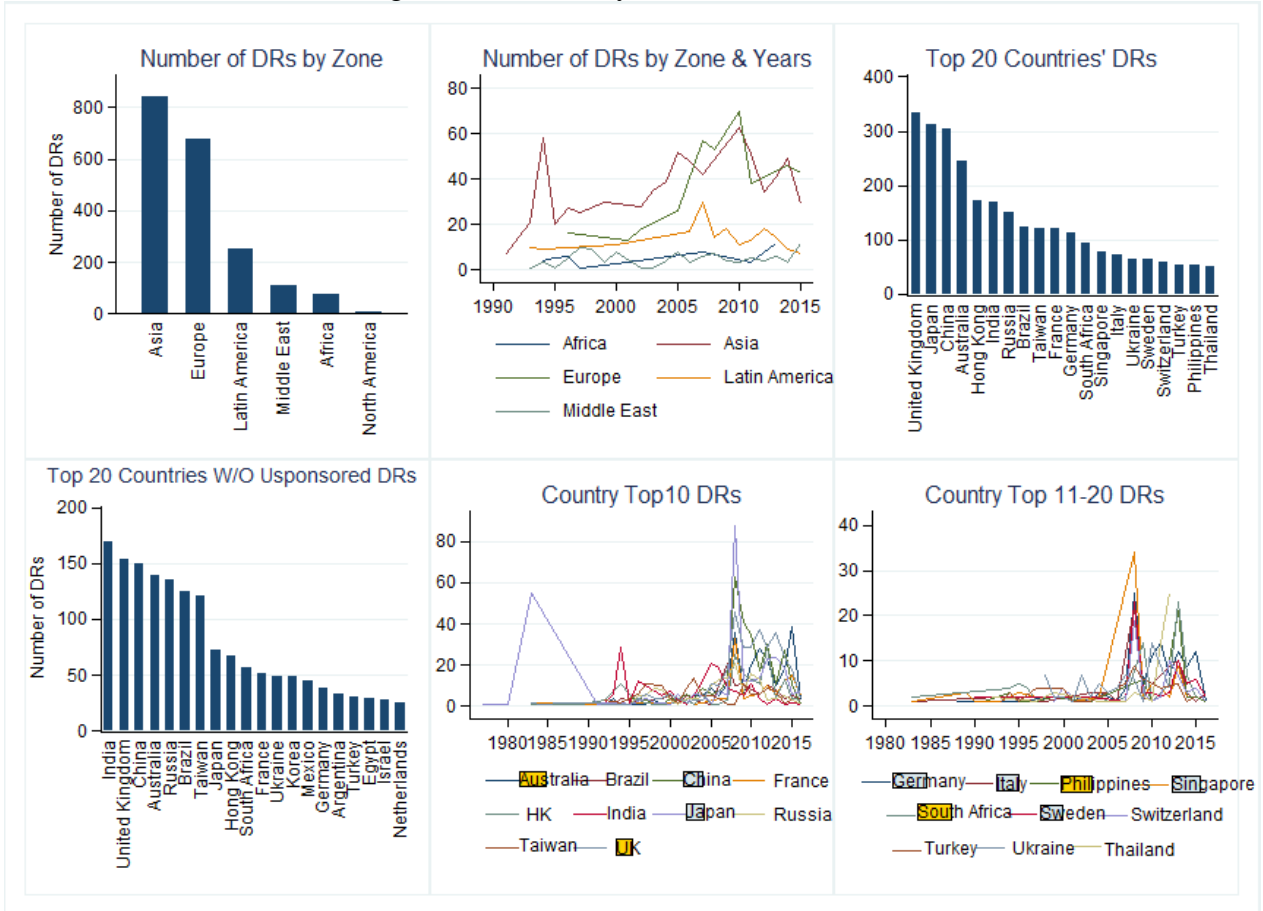


Sources: All data are collected from DR directory provided by BNY MELLON.

DRs Trends by Zone, Countries, and Industries

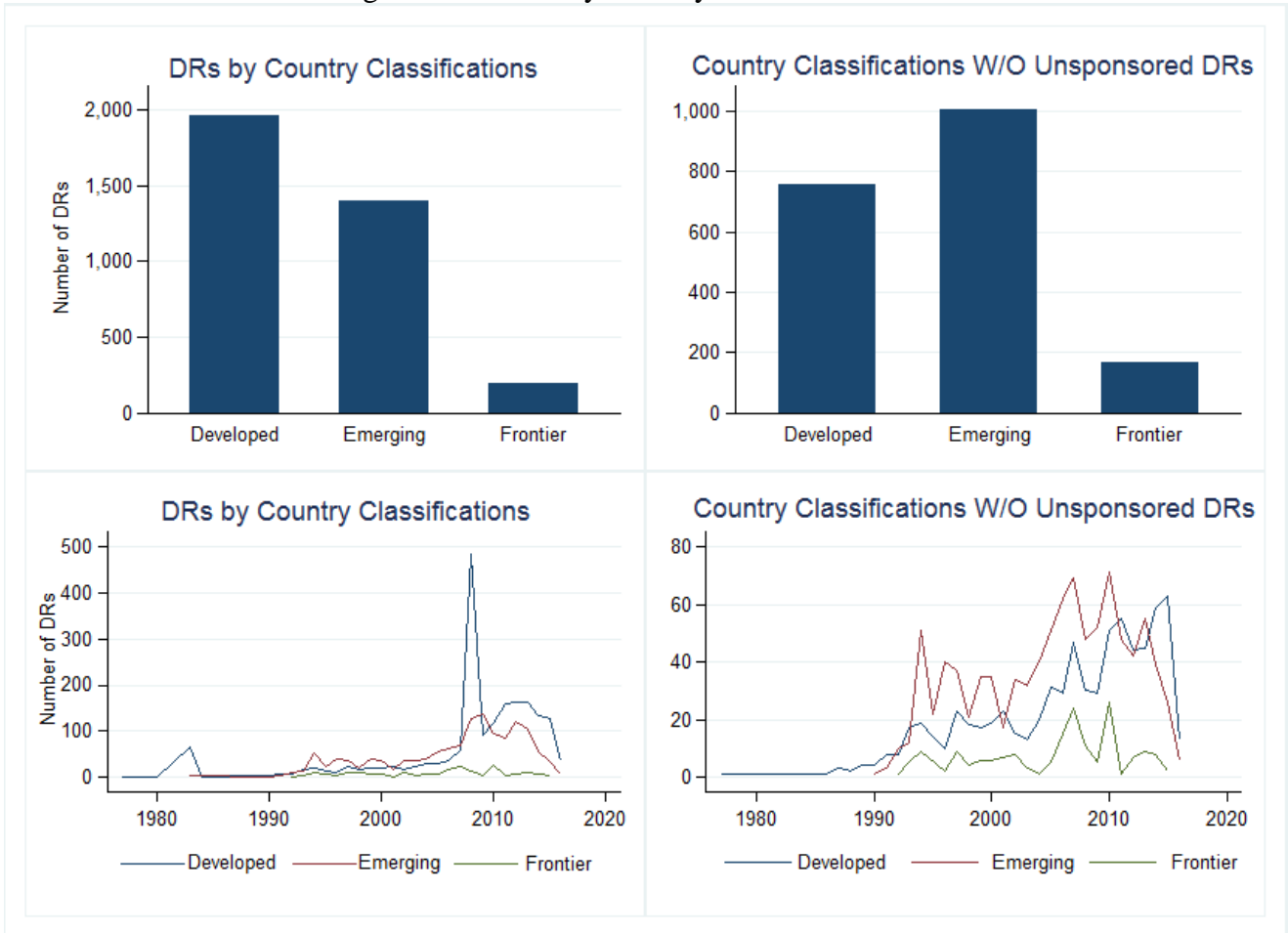
In Figure 1.3, Asia as a total has the largest number of DRs, and Europe holds the second number of DRs. From 1990 to 2014, DRs in Asia was growing strongly. After 2000, DRs in the Middle East was explosive growth as well. The third zone of DR growth was Latin America. The top ten DR issue countries are the U.K., Japan, China, Australia, Hong Kong, India, Russia, Brazil, Taiwan, and France. However, if just counting sponsored DRs, India was the largest DR issue country. In 2008, the top issuing countries are Japan, China, Germany, Italy, Singapore, and Sweden. From 2009 to present, DR growth was increasing rapidly in the U.K., Austria, Philippines, and South Africa. According to country classifications, developed countries issue the greatest number of DRs. However, without counting unsponsored DRs, emerging countries have largest DR issues (Figure 1.4). Based on the industrial-level analysis, in 2008, DR issues jumped up in financial services, general retailers, mining, and industrial transportation. And then, general retailers and mining continued to raise DRs until 2014. Recently, since U.S. investors are interested in Pharmaceutical and Healthcare sectors, the relevant DRs are growing rapidly (Figure 1.5). Therefore, the demands of depositary receipts are impacted by the business and investment environment as well as new industrial development.

Figure 1.3: ADRs by Zone and Countries



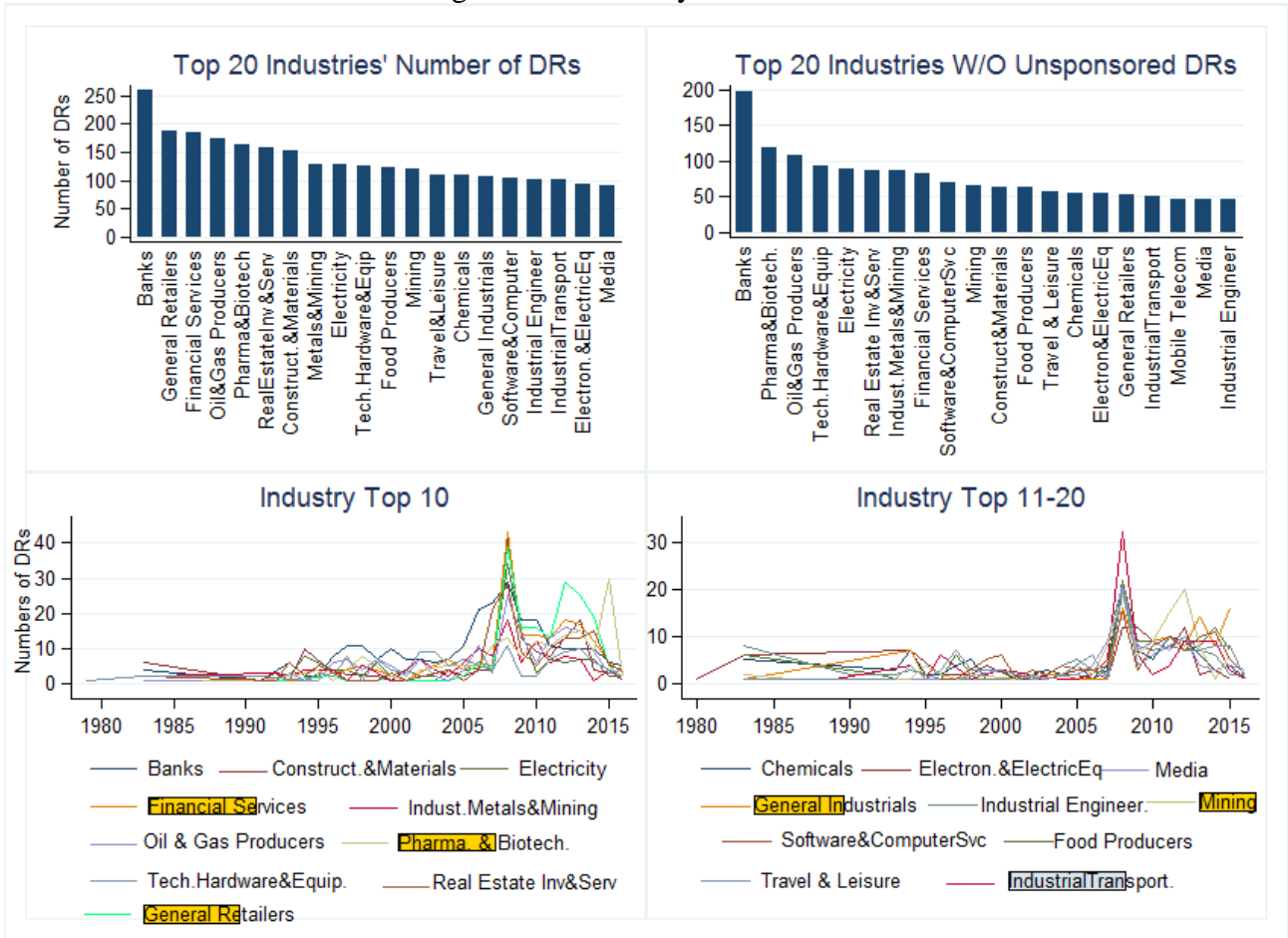
Sources: All data are collected from DR directory provided by BNY MELLON.

Figure 1.4: ADRs by Country Classification



Sources: All data are collected from DR directory provided by BNY MELLON.

Figure 1.5: ADRs by Industries



Sources: All data are collected from DR directory provided by BNY MELLON

Motivations of Cross-listing

Because ADRs or GDRs appear, global firms have opportunities to issue cross-listing equities. The market segmentation hypothesis shows that cross-listing would mitigate barriers to capital flows, resulting in a lower cost of capital (Miller, 1999). Some empirical evidence shows that the risk premium in two markets would disappear, the share price would increase, and the expected return would decrease, if the international market is integrated (Errunza & Miller, 2000; Bekaert & Harvey, 2002; Bekaert, Harvey, & Lumsdaine, 2002; Bekaert & Harvey, 2003). Moreover, the market liquidity hypothesis shows that cross-lists on the high liquidity markets could increase firm's liquidity in home countries. Some empirical studies have already found that higher cross-listing liquidity in the U.S. markets has positive effects on the home market liquidity (Hales & Mollick, 2014). However, some studies emphasize that unadjusted liquidity significantly improves after cross-listing because of inter-market competition and additional order flow, but after controlling contemporaneous changes in liquidity, domestic liquidity improvements are not due to cross-listing (Berkman & Nguyen, 2010). Furthermore, the investor recognition hypothesis suggests that an increase in investor awareness of a firm valuation would reduce the expected return on the stock. Foerster and Karolyi (1999) hypothesize changes of the cost of capital are associated with cross-listings that are not due to the effects of market segmentation but rather to investor recognition and liquidity factors. Due to information asymmetry between different types of investors, information availability (i.e. accounting disclosure, analyst coverage and media attention) is likely to motivate cross-listing (Baker, Nofsinger, & Weaver, 2002; Lang, Lins, & Miller, 2003). In turn, cross-listing also improves information environment of asset pricing (Foucault & Gehrig, 2008). More specifically,

Fernandes and Ferreira (2008) show cross-listing improves information environment for developed market firms, but decreases information environment for emerging market firms.

With the increase in globalization, the discussion of cross-listing on direct barriers (i.e. trade, liquidity, information available) gradually fade out to be replaced by indirect barriers of ownership restrictions. The bonding hypothesis shows cross-listing acts as a bonding and monitoring mechanism to commit companies voluntarily to higher standards of corporate governance and provide a better investor protection. Cross-listing foreign firms, from poorer investor rights, would reduce agency costs and enhance growth opportunities (Doidge, Karolyi, & Stulz, 2004). In turn, when agency conflicts (or consumption of private benefits) are high, the foreign firms are less likely to choose to cross-list in the U.S. (Doidge, Karolyi, Lins, Miller, & Stulz, 2009). Based on the debate between the market segmentation and bonding hypothesis, Doukas and Wang (2014) show that the bonding effect is mitigated in an increasingly integrated global capital market. However, the avoiding or signaling hypothesis shows that firms choose cross-listing since they don't have the intention to improve corporate governance, but they signal their better business quality and signal their ability to meet the higher disclosure requirements (Licht, 2003).

Cross-delisting and Cross-listing Biases

Beside the above big theories of cross-listing, some host and home biases (i.e. regulatory changes, choices of exchanges, geographic locations, culture, and industrial proximity) play important roles in the cross-listings choices and cross-delisting (Sarkissian & Schill, 2004; Roosenboom & van Dijk, 2009; Pan & Brooker, 2014). First, a number of foreign firms delist their stocks in the U.S. exchanges and turn to choose global depository receipt or OTC, since the Sarbanes-Oxley Act (SOX) in 2002 and Rule 12h-6 in 2007 increased costs of cross-listing

(Daugherty & Georgieva, 2011; Bessler, Kaen, Kurmann, & Zimmermann, 2012). Second, cross-listing decisions on a given exchange are associated with the geography of exchanges. High-tech and export-oriented firms that expand rapidly without much leverage tend to cross-list in the U.S. exchanges, but low growth firms tend to cross-list in the Europe exchanges (Pagano, Röell, & Zechner, 2002). Pan and Brooker (2014) explore the geography of Chinese cross-listings in global exchanges and they find that Hong Kong, New York, Singapore, and London are the preferred listing destination. Also, The exchanges in Sydney, Toronto, Frankfurt, Seoul, Kuala Lumpur and Taipei are attracting more Chinese firms (Pan & Brooker, 2014). Third, cultural characteristics and degree of individualism are likely related to the cross-listing and cross-delisting choices (Daugherty & Georgieva, 2011; Dodd, Frijns, & Gilbert, 2015). Firms appear likely to cross-list in countries with same languages, more liquidity, and larger markets (Pagano, Randl, Röell, & Zechner, 2001; Wang & Zhou, 2015). Fourth, institutional quality affects the cross-listing choices (Doidge, Karolyi, Lins, et al., 2009). Cosset, Martineau, and Samet (2014) show that foreign firms from countries with weak political institutions are more likely to cross-list via OTC and less likely cross-list via NYSE. Chinese state-owned enterprises with strong political connections are more likely to cross-list in the U.S. exchanges (Hung, Wong, & Zhang, 2012).

Price Discovery, Arbitrage, and Mispricing

The law of one price shows that identical goods should have identical prices, but in practice, an argument of market efficiency between emerging and developed capital markets successfully challenged the law of one price (Lamont & Thaler, 2003; Ansotegui, Bassiouny, & Tooma, 2013). Transaction costs, holding costs, and taxes make arbitrage costly. Mispricing between underlying stocks and ADRs exists to the extent that arbitrage costs prevent a rational trader

from fully eliminating inefficiencies (Pontiff, 1996; Gemmill & Thomas, 2002; Grossmann, Ozuna, & Simpson, 2007; Blouin, Hail, & Yetman, 2009; Grossmann & Beach, 2010). In the accounting and auditing fields, some studies examine whether foreign companies can continue to take advantage of relative mispricing under SOX (Piotroski & Srinivasan, 2008). Hope, Kang, Thomas, and Vasvari (2008) show that mispricing of foreign earning is mitigated by the introduction of the Statement of Financial Accounting Standards No.131 (SFAS 131). In addition, the differences in capital gains taxes cause arbitrage as well (Blouin et al., 2009).

Furthermore, short sale constraints in home markets restrict arbitrage opportunities to achieve ADR-stock parity (Lamont & Thaler, 2003; Gagnon & Witmer, 2014). In contrast, short selling on a U.S. exchange makes a significant contribution to price discovery, when underlying stocks cannot be short sold in home markets (Brockman & Hao, 2011). Finally, information asymmetries cause mispricing, resulting from the market segmentation, time difference, macro news, and market conditions (Hsu & Wang, 2008; Frijns, Indriawan, & Tourani-Rad, 2015). The lack of information flow between issuers and investors significantly impacts stock-ADR parity (Beckmann, Ngo, & Wang, 2015), but higher investor attention significantly reduces ADR mispricing (Eichler, 2012). For a cross-listing firm, the time difference among different national stock-markets is likely associated with cross-listing mispricing, since the stock price in one market may provide more information to another market at a later time (He & Yang, 2012).

The market microstructure theory explains the role of information in the price discovery and determinants of liquidity and transaction costs. Domowitz, Glen, and Madhavan (1998) show the two opposite situations of international cross-listing. On the one hand, if information linkages are perfect between host and home markets, cross-listing decreases spreads, reduces information asymmetries among all investors, and increase liquidity in both markets. On the other hand,

under inefficient information linkages, cross-listing lead to lower home market liquidity and higher price volatility. However, this effect is mitigated by improved inter-market competition, which narrow bid-ask spreads. In the four main Latin American countries, cross-listing stocks do not necessarily present a liquidity benefits, Silva and Chávez (2008) show that the liquidity effect of cross-listing depends on the trade-off between order flow migration and inter-market competition. Bris, Cantale, Hrnjić, and Nishiotis (2012) find that the effect of cross-listing on the sensitivity of price volatility can be impacted by market microstructure frictions (i.e. order flow migration and order processing costs). Additionally, through comparing cross-listing firms in LSE and cross-trading firms in the Stock Exchange Automated Quotation International market (SEAQ-I), there is no significant change in the home market liquidity for cross-listing firms relative to the cross-trading firms.

Spillover Effects

In the current studies, there are very ambiguous evidence about return and volatility linkages between underlying stocks and ADRs (or GDRs). Alhaj-Yaseen, Lam, and Barkoulas (2014) show the detailed literature review of spillover effects for cross-listing firms in three perspectives. The home bias hypothesis shows that home market dominates influential information and determines the ADRs or GDRs prices. On the contrary, global center hypothesis shows that the information generates and transmits from higher liquidity markets (developed markets) to lower liquidity markets (emerging countries). Finally, the bidirectional flow hypothesis shows that both home and host markets play important roles in the price discovery. However, some of the studies argue that the spillover effects between underlying stocks and ADRs are not mainly driven by information flows but by policy and corporate governance

changes, exchange rate changes, and sentiment effects (Bae, Kwon, & Li, 2008; Cai, McGuinness, & Zhang, 2011).

Purposes of the Study

Financial liberalization allows free flow of capital and removes barriers to international investing. The first essay in Chapter II aims to explore what factors drive capital flows in both developed and emerging countries. On the one hand, push factors play a significant role in the international capital flows. Some studies show that changes in the U.S. monetary policy and the supply of global liquidity (especially for the U.S. liquidity) will significantly influence capital flows in emerging countries (Warnock & Warnock, 2009). With economic globalization and trade internationalization becoming deepen, international capital flows are not always dominated by the U.S but impacted by the European Union, Japan, and some emerging countries. This study supposes that global economic growth will significantly impact capital flows. During the economic boom of emerging countries between the 1990s and 2000s, a large number of investments flows moved from advanced economies to emerging economies. However, after 2010, economic weakness in both emerging and advanced economies, there were weaker inflows and stronger outflows in emerging countries and weaker outflows in developed countries. Moreover, some commodity price such as global oil price will also affect capital flows, especially in oil-exporting countries. Falling oil price in 2015 resulted in capital outflows from these countries, such as Russia, Saudi Arabia, Canada, and Latin America.

On the other hand, pull factors should also affect international capital flows. The liquidity of domestic stock-markets and domestic credit provided by banks should be related to both international capital inflows and outflows. The advanced economies, such as the U.S. and U.K., attract the most global capital inflows and also export their capital to the worldwide. Thus, the

fluctuations of the U.S. financial markets will send shock waves to global economies. Moreover, some well-developed financial markets such as Hong Kong, Singapore, and Japan, have significant impacts on the demand and supply of global capital. Furthermore, some well-developed financial markets in emerging countries such as China and Korea have experienced heavy inward investments and are widening outward investments in the future. Thus, this essay supposes that the financial development is positively associated with both capital inwards and outwards.

In addition, because developing economies exhibit much higher currency and liquidity risks, capital restriction and foreign currency reserves might help regulate high volatility of capital flows. However, in the current global capital markets, capital controls and macroprudential policies in emerging countries also incur the imbalance of capital flows between emerging and advanced economies. This study suggests that an efficient capital flow management will facilitate stability of capital flows between advanced and emerging nations through well-directed and coordinated global collaboration.

The second essay in Chapter III first explores country's and firm's cross-listing activities. Most previous studies explore motivations of ADRs, but few studies examine how domestic financial development is associated with country's demands of DRs. Some previous studies show that the well-developed underlying financial market is associated with subsequent higher internationalization of stock-market activities (Domowitz et al., 1998; Claessens et al., 2006). However, the "migration and spillover" arguments show that international firms migrate from domestic markets to major international markets, suggesting international stock-markets could reduce the trading activity of domestic firms in emerging countries (Levine & Schmukler, 2007).

Different from previous studies, the first part of essay supposes that there is a threshold effect of financial development on country's demands for ADRs.

In the academic literature, a number of studies show the corporate decision on list shares on an overseas stock exchange (Karolyi, 1998). Different from previous studies on motivations of cross-listing, the second essay attempts to distinguish why firms or investors choose 1) GDRs or ADRs, 2) Level I or Level II&III ADRs, and 3) sponsored DRs and unsponsored DRs. First, on the basis of comparison and event study, this essay discusses the difference in abnormal returns of domestic shares because of different choices of DRs. Second, it explains that how choices of DRs are affected by financial development, and it also controls for domestic disclosure index, political stability, cultural distance, and firm characteristics.

CHAPTER II

DRIVERS OF CAPITAL FLOWS: EVIDENCE FROM G20 COUNTRIES

Introduction

Since globalization accelerates capital integration between advanced and emerging economies after the 1970s, a large number of studies argues that capital flows from rich to poor countries. The capital inflows increase the standards of living and promote economic growth in developing nations. Also, international capital flows diversify investment portfolios and achieve a better return on pension funds and retirement accounts for developed countries. However, the capital inflows suddenly slowed down in the late 1990s, increased rapidly throughout the mid-2000s, contracted sharply during the 2007-2009 financial crisis, and then rebounded after 2010 (Forbes & Warnock, 2012). Facing the high volatility of capital flows and imbalance of capital flows between emerging and advanced economies, the topic of capital flow management is always attractive to researchers and policymakers.

Some studies show that the external factors are primary drivers of capital flows, such as financial crisis, mature economy interest rates, mature economic growth, and shocks in U.S. equity markets (Agénor, 1998; Baek, 2006; De Vita & Kyaw, 2008; Fratzscher, 2012). In the era of globalization, international capital flows are not only driven by mature economies but also impacted by global economic changes. By extending previous empirical evidence, this study hypothesizes that the international capital flows are impacted by external factors, such as world

economic growth and the fluctuations of crude oil. Some studies, however, emphasize the pull factors are the primary drivers of capital flows after 2010's subsequent recovery (Fratzscher, 2012). In the literature, a number of empirical evidence shows that capital flows are impacted by domestic factors, such as opening-up policies in emerging countries, domestic economic growth, asset return indicators, country risk indicators, financial liberalization, macroeconomic policies, and reserve accumulation (Chuhan, Claessens, & Mamingi, 1998; Montiel & Reinhart, 1999; Klitgaard & Higgins, 2004).

The G20 is a global forum, which brings together the world's advanced and emerging economies. Currently, there are 8 advanced economies (i.e. Australia, Canada, France, Germany, Italy, Japan, the U.K., and the U.S.), 11 emerging economies (Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey), and the European Union. The development of G20 plays a critical role in the world economy since the G20 accounts for eighty-five percent of world GDP and two-thirds of the world population (Vestergaard & Wade, 2012). The G20 heads of government have periodically conferred at summits to discuss policy issues pertaining to the promotion of international financial stability.

According to G20 Guiding Principles for Investment Policymaking, the G20 countries agree to move towards better openness for global capital flows and facilitate investments that take place in a nation with weak growth (Barone & Bendini, 2015; Sauvart, 2016). However, in the 2008 global financial crisis and the 2010 recovery, the shocks of capital flows have highly heterogeneous effects across countries (Fratzscher, 2012). Global leaders are seeking cooperative solutions to prevent further crises. Also, the G20 summit works on macro-prudential policy frameworks, including tools (i.e. capital controls and foreign currency reserves) to mitigate the impact of excessive capital flows (Kevin P Gallagher, 2015). In the future, an efficient capital

flow management, from a practical economic and financial risk management perspective, will facilitate stability of capital flows between advanced and emerging nations.

This paper contributes some new empirical evidence to academic studies on the capital flow management and international monetary policies. This study applies panel vector autoregression (Panel-VAR) to capture the linear interdependencies among stock traded/GDP, real-world GDP growth, and FDI inflows. Next, the further study examines how capital flows are associated with pull and push factors by using system GMM methodology and fixed effects regressions. First, this study hypothesizes that international capital flows are significantly impacted by the liquidity of the stock-market because domestic financial development can help absorb capital flows and deal with their volatility. Second, push factors also play important roles to drive capital flows. For example, the growth of global economy significantly impacts the size and composition of capital flows across G20 countries. The capital inflows from advanced economies to emerging economies are greatly affected by U.S. monetary policies and the supply of U.S. dollars. The volatility of crude oil price has some spillover effects on capital flows. Finally, this study controls for foreign currency reserves and capital restriction, because government intervention on capital accounts should have a noticeable impact on capital flows, especially in the emerging countries.

Literature Review

After the 1990s, a number of studies support neoclassical growth model, in which capital flows from richer countries with the relatively high capital-to-labor ratio to poorer countries with relatively low rates (Calvo et al., 1996). However, since the Mexican currency crisis in 1994 and the Asian crisis in 1998, there was a substantial decrease in capital inflows to emerging countries. Thus, some studies have questioned the neoclassical economic framework and showed “Lucas

Paradox” and “allocation puzzle,” which indicate a lack of capital flows from rich to poor countries (Lucas, 1990; Alfaro, Kalemli-Ozcan, & Volosovych, 2008; Benhima, 2013; Gourinchas & Jeanne, 2013). According to theoretical and empirical studies, the drivers of capital flows can be directly determined by the push-pull framework: pull (or domestic) factors and push (or external) factors. Koepke (2015) shows that push factors (i.e. U.S. interest rate and U.S economic growth) significantly matter the most of the portfolio flows, while pull factors (i.e. domestic economic growth and country risk indicators) are most important for banking flows.

Two Puzzles in Capital Flows

In neoclassical growth theory, capital should flow from rich countries with the relatively high capital-to-labor ratio to poor countries with relatively small ratios, due to the effect of diminishing returns of capital. However, the empirical evidence shows that the volume of capital flows to GDP in emerging countries is surprisingly low, which is the so-called Lucas Paradox. Lucas (1990) proposes that the capital transmission from rich to poor countries can be influenced by two categories: 1) international market imperfections, such as sovereign risk and information asymmetry, and 2) huge differences in fundamentals, such as institutional qualities, production capability, and technology. Some studies show that institutional quality, corporate governance, and quality of financial system are primary causal variables explaining the Lucas Paradox (Alfaro et al., 2008; Ju & Wei, 2010).

The allocation puzzle states that international capital flows do not move to countries with high growth and high investment rates, but flow to low growth and low investment rates. (Aizenman, Jinjark, & Park, 2013; Gourinchas & Jeanne, 2013). Because Asia has experienced relatively great growth and high investment rates, it should have imported capital rather than exporting it. However, the reality is that high-growth and high-investment Asian countries tend

to experience capital outflows. Some studies try to explain why such imbalances are originating in Asia and not in other emerging regions. Benhima (2013) shows that Asia growth has not been compensated by a matching increase in human wealth, although it has increased a large capital accumulation. Thus, the asset demand of Asia is high relative to the asset supply, leading to capital outflows. Gourinchas and Jeanne (2013) argue that emerging countries resist the real appreciation of their currency for exports by the accumulation of foreign assets and restrictions on capital inflows. And then, emerging countries with higher growth in the tradable sector lead to higher trade surpluses and so (as a matter of accounting) higher net capital outflows. In addition, excess net saving arises from excessive savings rather than an investment shortage among some emerging countries that run large current account surpluses.

Push Factors

First, in the 1990s, the falling interest rates in the U.S. attracted investors to the high yields and high-growth economies in Asia and Latin America (Calvo et al., 1993, 1996; Baek, 2006). At the same time, most emerging countries appear to increase borrowing from U.S. under the low-interest rate. However, in the mid-1990s, a rise in interest rate by tightening of monetary policy in the U.S. made an investment in Asia and Latin America relatively less attractive (Calvo et al., 1993, 1996). Second, some empirical studies show that global risk aversion robustly impacts capital flows (Forbes & Warnock, 2012). During the financial crisis, foreigners reduce their investment, and domestic agents also reduce capital outflows (Milesi-Ferretti & Tille, 2011; Fratzscher, 2012; Broner et al., 2013). Third, mature economic growth, especially U.S. economic growth, positively drives global capital flows (Baek, 2006; De Vita & Kyaw, 2008; Forbes & Warnock, 2012). Fourth, international portfolio diversification stimulates U.S. and other investors to hold foreign securities. Some studies show that U.S. investors obtain significant benefits from international diversification

(Gilmore & McManus, 2002). Finally, international capital flows are positively associated with worldwide stock returns, consistent with positive feedback trading by international investors (Froot et al., 2001). Market microstructure studies show that investors are more likely to invest in foreign assets in periods when the return on foreign assets is high and to sell when the return is low, if domestic investors have a cumulative information advantage over foreign investors about their domestic market (Brennan & Cao, 1997; Froot & Ramadorai, 2008). When there are barriers to international capital flows and when the expectations of foreign investors are more extrapolative than those of domestic investors, unexpectedly high global stock returns lead to net equity inflows in small countries at the daily frequency (Griffin, Nardari, & Stulz, 2004).

Pull Factors

First, domestic economic growth is an important driver of capital flows (Baek, 2006), but Kim (2000) argues that domestic factors are relatively less important than push factors. Second, there are a number of studies show that how international capital flows interact with domestic market liquidity. Some studies show that financial development is positively associated with domestic firms investing abroad (Di Giovanni, 2005; Claessens et al., 2006). Second, country risk indicators do influence capital flows. Kim and Wu (2008) show that the better sovereign credit rating on foreign and local debt tends to attract capital flows. Third, Asiedu (2006) shows that the foreign direct investments in Africa are promoted by large market size, natural resource endowments, great infrastructure, low inflation, good institutional quality, and good investment framework. Fourth, some studies argue domestic institution quality has a substantial impact on international flows (Papaioannou, 2009; Ju & Wei, 2010; Okada, 2013). Finally, after the 1970s, more and more emerging countries adopt open-up policies and offer special tax incentives and subsidies to attract foreign investments (Carkovic & Levine, 2002). Also, some studies show that

policy environments, such as liberalizing capital controls and policies of reserve currency, significantly impact capital flows (Mody & Murshid, 2005; Edison & Warnock, 2008; Binici et al., 2010; Reinhardt et al., 2013).

Limitations of Push-Pull Framework

A push-pull framework is an efficient approach to analyzing drivers of capital flows, but some factors do not fit into either push or pull categories, such as contagion effects and information asymmetries (Koepke, 2015). Since international capital markets are fictional, they are segmented by asymmetric information or home biases. Some studies show that the asymmetric information, measured by geographic distance, is an important barrier of capital flows (Portes & Rey, 2005; Aviat & Coeurdacier, 2007). Some studies show that push factors to developing economics can be a source of contagion, because a large capital shift from one or two countries (i.e. Mexico and Chile) may generate externalities for most Latin America countries (Calvo et al., 1996). Also, capital flows are driven by shifts in market sentiment or “hot” money (Baek, 2006). The investor’s speculative behaviors would result in volatile movements of capital flows between emerging and developed countries.

Capital Flow Components

The international capital flows mainly include foreign direct investment (FDI) and foreign portfolio investment (FPI), and bank lending. The FDI represents establishing a long-term business in a foreign country, such as international mergers and acquisitions, and manufacturing transfers to countries with a cheap labor force. Moreover, the FPI typically indicates the short-term investment in financial assets, such as portfolio equity and portfolio debt. The empirical evidence shows that FDI is driven more by domestic financial development or economic growth and less by global financial fluctuations (Di Giovanni, 2005; Dutta & Roy, 2011). By contrast,

FPI is more driven by short-term change than FDI. Specifically, portfolio equity is highly associated with fluctuations of the global stock-market, and portfolio debt is more related to risks of currency markets (Chuhan et al., 1998; Albuquerque, 2003; Baek, 2006; Broner et al., 2013). Moreover, some studies show that cross-border bank lending has been increasing rapidly, and the financial crisis significantly impacts the bank lending (Herrmann & Mihaljek, 2013; Kleimeier, Sander, & Heuchemer, 2013).

The Effect of International Capital Flows

From the previous literature and the following analyses, most capital flows will not always move from rich to poor countries because investors always pursue high yields and low cost of capital. However, globalization transfers a part of capital flows and technology into emerging countries. As a result, some studies show that global capital flows reduce income inequality between emerging and advanced economies (Bhandari, 2007; Jaumotte, Lall, & Papageorgiou, 2013). Moreover, some studies show that foreign investments play a major role in contributing to GDP growth (Reisen & Soto, 2001; Hermes & Lensink, 2003), but they significantly promote economic growth through financial market development (Hermes & Lensink, 2003; Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004).

Hypothesis Development

This study supposes that both push and pull factors play significant roles in determining international capital flows. Some previous studies argue that pull factors are not the main factor to drive international capital flows. With economic globalization and political multi-polarization, G20 countries include 8 advanced economies, European Union, and 11 largest emerging economies. In the contemporary world, each of the 20 largest economies plays important role in the global capital flows. Domestic financial development is an important determinant of output

and investment, and it has positive effects on output and investment. Well-developed capital markets that provide a rich pool of investment opportunities and plenty of exit options are likely to be found in large, stable, and growing economies (Di Giovanni, 2005). It is reasonable to hypothesize that a well-developed financial market will attract more capital from foreign nations. The capital inflows, in turn, promote economic and financial development as well. Moreover, according to the investment development path hypothesis, Dunning (1981) shows that countries raise their investment abroad followed the economic and financial development.

In the context of globalization, all countries share global risks and liquidity problems. This study hypothesizes that the volatility of global economic conditions and oil prices significantly affect international capital flows. Finally, some studies show that macroprudential policies in Asian nations encourage reserve accumulation and maintain high levels of capital inflows (Klitgaard & Higgins, 2004; Patnaik, 2007). This study controls for interest rate, reserve accumulation growth and capital restriction.

Data

This study explores how global and domestic factors impact capital flows in G20 countries. First, this study describes and analyzes G20 capital flows and the world's capital flows, which are collected from IMF-International Financial Statistics from 2000 to 2015 at an annual frequency, including the foreign direct investment and foreign portfolio investment (FDI inwards, FDI outwards, and FPI inwards). This study also collects net FDI inwards/GDP, net FDI outwards/GDP, and net FPI inwards/GDP from World Development Indicators (WDI). Second, the domestic financial development, the stock traded/GDP, and domestic credit by banks/GDP, are collected from WDI as well. Third, the international capital flows are not only associated with domestic factors but also impacted by global factors. This study collects the price

of WTI crude oil and growth of world GDP from DataStream. Finally, besides full-push factors, this study also controls for real interest rates, capital controls and international currency reserves. Global capital flows have increased significantly in recent years, but the costs of capital flows are not eliminated, especially in some emerging countries. This study describes capital restrictions on inflows and outflows from 2002 to 2015 based on a new measure of capital controls developed by Fernández, Klein, Rebucci, Schindler, and Uribe (2016). The growth of reserve accumulation is collected from IMF-International Financial Statistics. The real interest rate from WDI is calculated as $(i-P)/(1+P)$, where I is the nominal lending interest rate and P is the inflation rate (as measured by the GDP deflator).

Methodology

This study first explores relationships between pull-push factors and international capital flows by applying a VAR method, which treats all variables as endogenous. Moreover, the Granger causality test is applied to examine whether a time series factor is useful in predicting another, and forecast error variance decomposition (FEVD) is used to investigate the amount of information each factor contributes to the other factors in the VAR model. According to the panel-VAR methodology developed by Love and Zicchino (2006), I propose a first-order VAR model as follows:

$$Z_{i,t} = \alpha_0 + \alpha_1 Z_{i,t-1} + f_i + v_t + e_t, \quad (1)$$

where $i = 1, 2, \dots, 19$ countries and $t = 1990, 1991, \dots, 2015$ years. $Z_{i,t}$ is a three-variable vector [real world GDP growth, either stock traded/GDP or domestic credit/GDP, and either FDI/GDP or FPI/GDP] from 2000 to 2015. This study transforms time series to become stationary by taking the first difference. f_i and v_t indicate unobserved individual effect and year effect. The order of the input variables is also following Love and Zicchino (2006)'s assumptions: the

variables that appear earlier in the VAR systems are more exogenous, and the ones that appear later are more endogenous. In the VAR models with three variables, this study assumes that the most endogenous variable is FDI or FPI inflows.

It also assumes real world GDP growth as the most exogenous variable because world GDP growth is not explained by one country's capital flows and stock-market liquidity, especially for some small countries. Jansen and Stokman (2004) show that countries that have comparatively intensive FDI relations also have more synchronized business cycles. Both larger inward and outward investment positions may make the domestic economy more susceptible to synchronized global business cycles. Moreover, this study assumes that financial development reaches a middle ground between world GDP and capital inflows because it is necessary for financial intermediation and the efficient allocation of investments within global economies. Financial development is measured by stock traded/GDP. Some studies show that stock-market development has positive effects on foreign investments, especially in the low-income countries (Henry, 2000; Durham, 2002; Lane & McQuade, 2014). On the contrary, foreign investments also might promote or decrease stock-market development (Claessens, Klingebiel, & Schmukler, 2001; Alfaro et al., 2004; El-Wassal, 2005).

This study employs system GMM methodology to explore how international capital flows are impacted by both pull and push factors and macroeconomic policies. Some studies show that the system GMM is an efficient approach to testing long-run growth and the availability of macroeconomic data for large panels of countries (Judson & Owen, 1999; Bond, Hoeffler, & Temple, 2001; Carstensen & Toubal, 2004). Because the system GMM allows independent variables that are not strictly exogenous (Arellano & Bond, 1991; Blundell & Bond, 1998), this study assumes the one lag of dependent variables (capital flows) as endogenous variables. Some

studies find that the role of stock-markets as a channel through which foreign capital flows could promote economic growth (Choong, Baharumshah, Yusop, & Habibullah, 2010) and countries with well-developed stock-markets gain significantly from capital flows (Alfaro et al., 2004). In addition, cross-border financial flows can influence domestic credit through multiple channels (Lane & McQuade, 2014). Since international capital flows experience interaction with stock traded/GDP, the lags of stock traded/GDP and domestic credit/GDP are used as instruments for financial development. The basic specification is as follows:

$$FLOWS_{i,t} = \alpha_0 + \beta_1 FLOWS_{i,t-1} + \beta_2 FD_{i,t} + \beta_3 FD_{i,t} \cdot CLASS + \beta_4 OIL_{i,t} + \beta_5 WD_GDP_{i,t} + \beta_6 RESERVE_{i,t} + \beta_7 INT_{i,t} + \beta_8 CONTROL_{i,t} + \beta_9 CRISIS + f_i + v_t + e_{i,t}, \quad (2)$$

where $i = 1, 2, \dots, 19$ countries and $t = 1990, 1991, \dots, 2005$ years. $FLOWS_{i,t}$ is either the net FDI inwards/GDP, or net FDI outwards/GDP, or net FPI inwards/GDP; $FLOWS_{i,t-1}$ is the first lag of the dependent variable; $FD_{i,t}$ is a measure of financial development (stock traded/GDP or domestic credit by banks/GDP); $CLASS$ is country classification: developed countries (0) and emerging countries (1); $OIL_{i,t}$ is WTI crude oil price; $WD_GDP_{i,t}$ is real world GDP growth; $RESERVE_{i,t}$ is foreign currency reserves/GDP; $INT_{i,t}$ is real interest rate; $CONTROL_{i,t}$ is the index of capital restrictions on inflows and outflows; $CRISIS$ is dummy variable: 2007-2009 financial crisis (1) and other periods (0); u_i is the country-specific effect; v_t is a time-specific effect; and $e_{i,t}$ is the error term. The sample size is 19 countries (i) and covers 16 years (t) from 2000 to 2015⁴.

Financial market development should be positively associated with capital inflows because the better domestic financial markets would smoothly absorb enough sharp capital movements and reduce the risk of capital flows having adverse effects on the real economy (Lee, 1997). A

⁴ The European Union (EU) is excluded from G20 because the data of capital flows are unavailable in the IMF.

more liquid equity market is likely to attract foreign investors. Also, a reversal of capital flows becomes less likely if both local and foreign investors are confident that markets will remain liquid even under adverse conditions. In turn, Levine (1997) shows that the effects of capital flows on economic growth occur through the channel of domestic financial intermediation. In other words, capital inflows promote the development of domestic financial markets and then have a positive influence on domestic growth. In addition, some studies show that surges in private capital inflows lead to domestic credit booms (Calderon & Kubota, 2012). However, FDI inflows may also crowd out domestic credit if foreign capital costs are lower than costs of domestic bank lending (Samarina & Bezemer, 2016). This study also supposes that countries with too much domestic credit tend to have a lower level of capital inflows.

Advanced economies provide stable economic and political surroundings for domestic and foreign investors, but emerging countries are different. Eq (2) introduces create an interaction term by using a dummy variable (emerging countries (1) and developed countries (0)) to distinguish the effects of domestic financial development on capital flows between developed and emerging countries. Moreover, the robustness tests use two subsamples to avoid inappropriate pooling of developed and developing countries.

Push factors are primary drivers of capital flows. In the previous studies, a number of studies show that the U.S. interest rate is primary push factor (Warnock & Warnock, 2009). Different from these studies, this study hypothesizes that world GDP growth and global oil price should be positively associated with capital flows. Some studies show the co-movements between capital flows and business cycles (Caporale & Girardi, 2016). Kim and Kim (2013) argue that increased capital flows due to financial integration generate substantial impacts on business cycles. The increased financial linkages among global economies should have a significant impact on

fluctuations in global external financing conditions. In particular, financial contagion and the attendant financial crises may be one factor behind the increased business cycle co-movement and affect capital flows among global markets. In addition, some studies show that commodity price cycles are associated with capital flow cycles and declines in both might lead to the financial crisis (Reinhart, Reinhart, & Trebesch, 2016). This study hypothesizes that the fluctuation of oil price might affect international capital flows as well.

Finally, this study also controls for real interest rate, levels of capital controls in each country and foreign exchange reserves. Interest rates are important to capital flows because capital flows move to countries with higher interest rates. However, compared with mature economies, emerging countries tend to use international reserves and capital controls to defend against currency crisis and intervene in foreign exchange market to offset to some extent the effects on their economies of large capital flows (Cardoso & Goldfajn, 1998; Reinhart & Reinhart, 1999; Glick & Hutchison, 2009). Thus, the accumulation of foreign exchange reserves is usually employed by policymakers in emerging countries in an attempt to stem the tide of capital flows.

Results

Descriptive Analysis

This section describes capital flows and push-pull factors. Figure 2.1 highlights each country's net capital inwards (or outwards) to the world net capital inwards (or outwards). Combined U.S. and U.K. economies contribute the most, about 20% of world's capital flows. Some other advanced economies, such as Germany, France, and Japan, have much more capital inwards of world total than capital outwards. The rest of nations appears to have more capital outwards than capital inwards except South Korea. Besides developed countries, most emerging countries in G20, such as Russia, China, Brazil, Mexico, India, and Indonesia, contribute very

high levels of FDI inwards and outwards. These results show that both advanced and emerging G20 members are important participants in the global capital flows. By contrast, Tables 2.1a and 2.1b show that net capital inwards and outward to domestic GDP. All developed countries have some higher capital outwards/GDP than capital inwards/GDP except Australia, while most emerging countries are just the opposite except South Korea and Russia.

Figure 2.1: The Capital Flows of G20

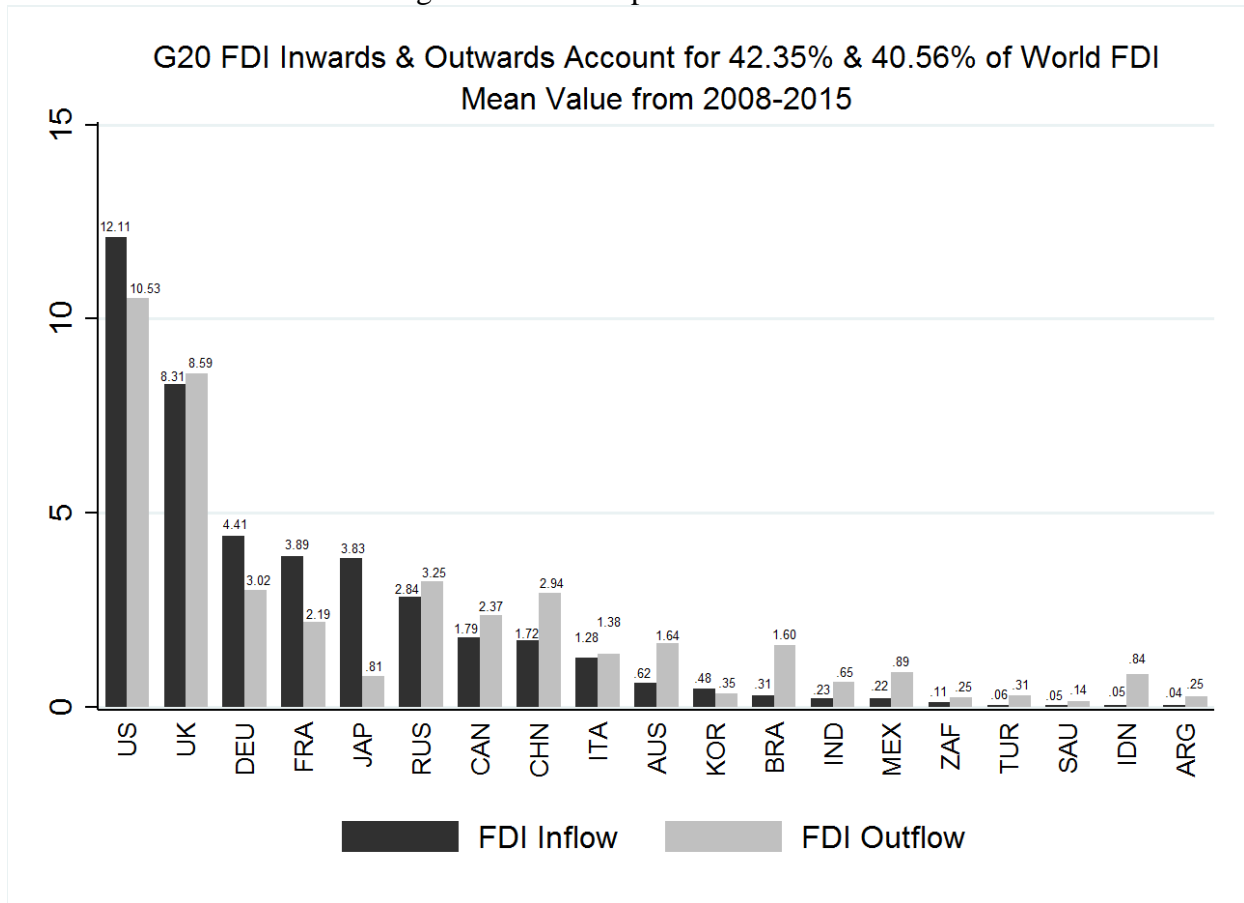
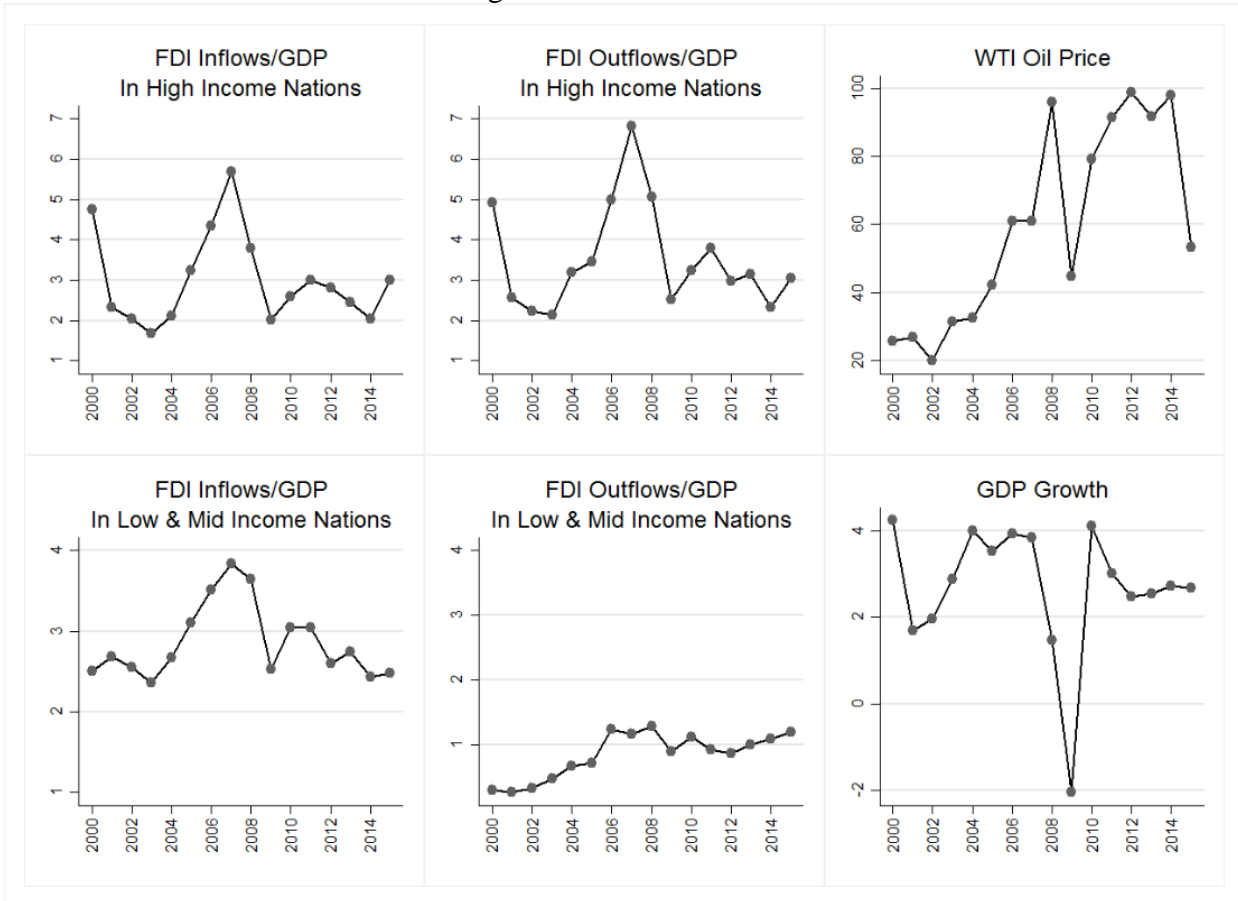


Figure 2.2 compares FDI flows in high-income countries and middle and low-income countries⁵. The global capital flows are influenced by the changing international economic environment. For example, in 2007 the capital inflows and outflows significantly raised in both advanced and emerging countries, but 2008-2009 global financial crisis triggered a global liquidity drought. In the high-income countries, the changes of FDI inflows were basically in agreement with the tendency of FDI outflows. From 2000 to 2014, FDI outflows were significantly higher than inflows, but outflows and inflows were basically the same in 2015. In the middle-low income countries, capital inflows gradually descended after 2010, but capital outflows were rising year by year. So far, the volume of FDI inflows is still much larger than outflows in the middle-low income countries. The weaker inflows and stronger outflows in emerging countries (or weaker outflows in developed countries) can be explained by the narrowing differential in economic growth between emerging and advanced economies.

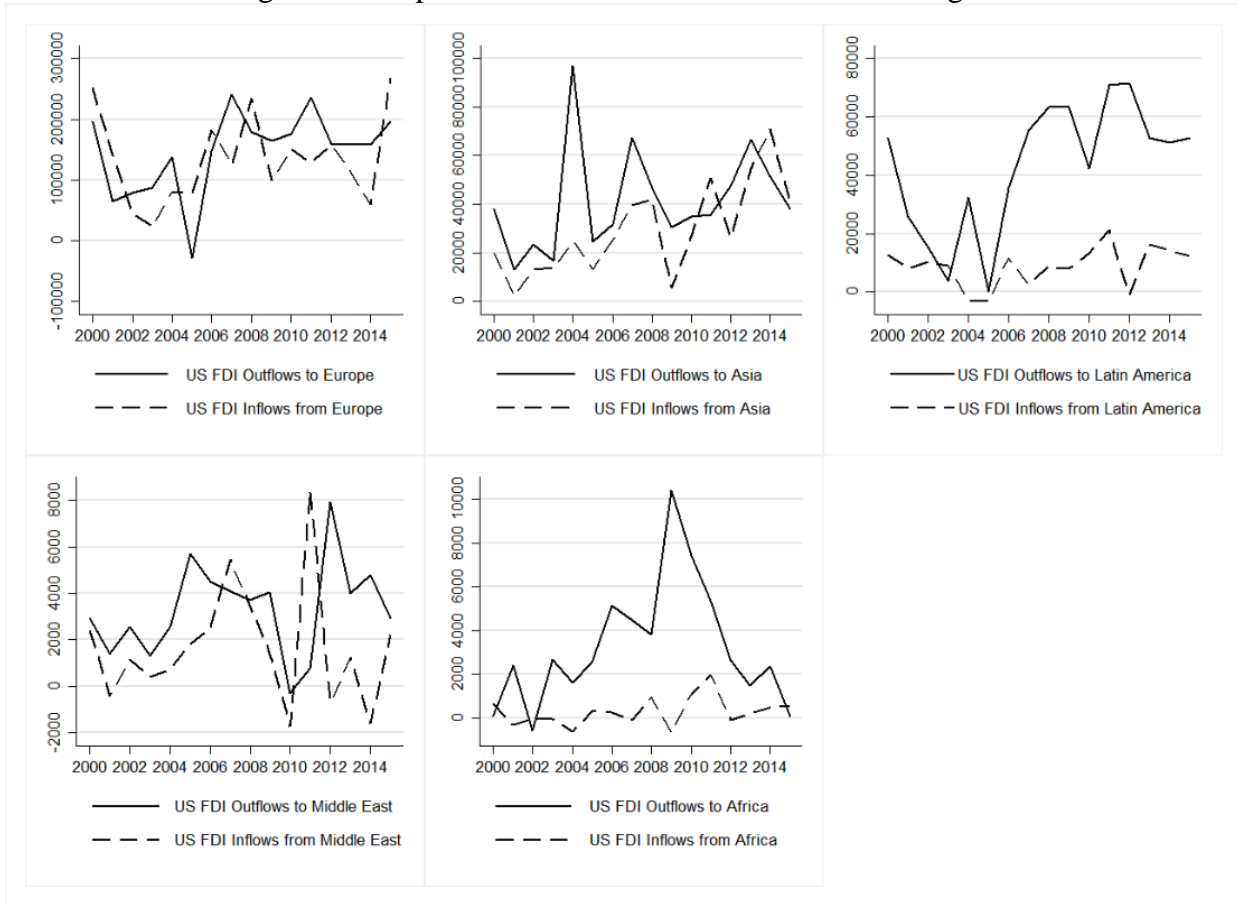
⁵ World Bank defines high-income economy (or developed country) as a country with a gross national income per capital over US\$12,236 in 2016. The middle and low-income economy is a gross national income per capital less than US\$12,236.

Figure 2.2: World Trends



Source: FDI inflows/GDP and FDI outflows/GDP in high, mid, and low-income nations are available in World Development Indicators (WDI). The WTI oil price and real GDP growth are collected from DataStream.

Figure 2.3: Capital Flows between the U.S. and Five Regions



Sources: The U.S.FDI inflow and outflows are collected from IMF World Economic Outlook.

This study also examines whether capital flows are driven by WTI crude oil prices. From Figure 2.2, from 2002 to 2007, both global capital investments and the oil price showed rising trends from 2002 to 2007, and they fell sharply in the 2008-2009 financial crisis. In the descriptive analysis, it is difficult to show the direct relationship between capital flows and oil price since they are impacted by the global economic development. Thus, the following multivariate analysis will further discuss the spillover effects between global capital investments and the oil price. Moreover, Figure 2.3 describes how capital flows between the U.S. and five regions. The global capital flows are mainly distributed between the U.S. and Europe, followed by the U.S. and Asia, the U.S. and Latin America, and the U.S. and Africa. In addition, the capital inflows are very close to outflows between the U.S. and Europe and Asia, while the U.S. outflows to Latin America and Africa are significantly larger than inflows from them.

Tables 2.1a and 2.1b show some important pull factors of capital flow: the liquidity of the domestic stock-market and domestic credit. Based on mean values in Table 2.1a, the liquidity of stock-markets is very high in some emerging countries, such as China, Korea, and Saudi Arabia, and domestic credit provided by banks is very strong in China, Korea, and South Africa. However, the financial development is low in some countries of Latin America, such as Argentina (14.15%) and Mexico (21.39%). By contrast, Table 2.1b shows that all developed countries have a relatively high level of financial liquidity in stock-markets and banks, especially in U.S. markets (i.e. 223% of stock traded/GDP and 184% of domestic credit/GDP, respectively).

Foreign exchange reserve is a critical macro-prudential policy to manage capital flows and exchange rate. Table 2.1b shows that all developed countries have a relatively lower foreign exchange reserve/GDP, except for Japan (0.184). Table 2.1a shows that some emerging countries

also have much more international reserves, especially in Saudi Arabia (0.599), China (0.342), Korea (0.238), and Russia (0.218). Moreover, every country has some restrictions on capital flows, but the average capital controls on both inflow and outflows are much higher in emerging countries than developed countries. In the developed countries, Australia has significant capital controls on both inflows and outflows, and Germany and the U.S. limit capital outflows.

Finally, correlation matrix in Table 2.2 detects multicollinearity among some of the independent variables. This study finds the high correlation coefficient between world GDP growth and oil price (0.715) and the stock traded/GDP and domestic credit/GDP (0.598). To deal with serial correlation, the following regression analysis puts 1) world GDP growth and crude oil price in separate models as well as 2) stock traded/GDP and domestic credit/GDP in two models.

Table 2.1a: Descriptive Statistics in 11 Emerging Countries

This table shows the mean value of each variable. Standard deviation lists in parentheses. The capital flows include net FDI inwards/GDP, net FDI outwards/GDP, and net FPI inwards/GDP. The financial development is measured by stock traded/GDP and domestic credit/GDP. The Int'l Reserve Growth measures macroeconomic policies of reserve accumulation. The real interest rates are collected from WDI. This study also describes capital restrictions on inflows and outflows from 2002 to 2015 based on a new measure of capital control (Fernández et al., 2016).

	Argentina	Brazil	China	India	Indonesia	Korea	Mexico	Russia	Saudi Arabia	South Africa	Turkey
FDI Net Inward/GDP	2.116	3.185	3.501	1.614	1.179	1.045	2.735	2.349	1.702	1.702	1.729
<i>(Std. Dev.)</i>	<i>(0.760)</i>	<i>(1.016)</i>	<i>(0.731)</i>	<i>(0.820)</i>	<i>(1.654)</i>	<i>(0.419)</i>	<i>(0.654)</i>	<i>(1.237)</i>	<i>(1.482)</i>	<i>(1.482)</i>	<i>(1.000)</i>
FDI Net Outward/GDP	0.308	0.747	0.780	0.638	0.971	1.586	0.745	2.543	0.455	0.458	0.336
<i>(Std. Dev.)</i>	<i>(0.351)</i>	<i>(0.745)</i>	<i>(0.356)</i>	<i>(0.528)</i>	<i>(0.278)</i>	<i>(0.734)</i>	<i>(0.509)</i>	<i>(0.962)</i>	<i>(0.377)</i>	<i>(1.247)</i>	<i>(0.213)</i>
FPI Net Inward/GDP	-0.020	0.603	0.054	0.015	0.000	0.000	0.009	-0.001	0.000	0.154	1.885
<i>(Std. Dev.)</i>	<i>(0.187)</i>	<i>(0.605)</i>	<i>(0.037)</i>	<i>(0.016)</i>	<i>(0.000)</i>	<i>(0.001)</i>	<i>(0.038)</i>	<i>(0.013)</i>	<i>(0.000)</i>	<i>(0.230)</i>	<i>(2.474)</i>
Stock Traded/GDP	1.371	26.042	92.364	48.372	10.817	118.611	8.111	30.187	112.128	57.309	43.615
<i>(Std. Dev.)</i>	<i>(1.004)</i>	<i>(11.731)</i>	<i>(86.097)</i>	<i>(24.332)</i>	<i>(4.244)</i>	<i>(37.275)</i>	<i>(2.660)</i>	<i>(26.417)</i>	<i>(108.956)</i>	<i>(17.608)</i>	<i>(9.250)</i>
Domestic Credit/GDP	14.151	45.060	121.292	43.309	27.740	125.911	21.393	35.316	36.395	140.507	38.398
<i>(Std. Dev.)</i>	<i>(3.691)</i>	<i>(15.163)</i>	<i>(13.543)</i>	<i>(9.477)</i>	<i>(5.847)</i>	<i>(19.121)</i>	<i>(5.980)</i>	<i>(13.837)</i>	<i>(7.999)</i>	<i>(13.753)</i>	<i>(22.759)</i>
Int'l Reserve/GDP	0.098	0.112	0.342	0.156	0.129	0.238	0.099	0.218	0.599	0.090	0.105
<i>(Std. Dev.)</i>	<i>(0.037)</i>	<i>(0.043)</i>	<i>(0.106)</i>	<i>(0.035)</i>	<i>(0.026)</i>	<i>(0.036)</i>	<i>(0.031)</i>	<i>(0.077)</i>	<i>(0.369)</i>	<i>(0.030)</i>	<i>(0.012)</i>
Real Interest Rate	-0.062	36.639	2.104	5.438	4.255	3.782	2.032	-1.586	N/A	4.304	N/A
<i>(Std. Dev.)</i>	<i>(10.846)</i>	<i>(9.323)</i>	<i>(2.575)</i>	<i>(2.657)</i>	<i>(4.610)</i>	<i>(1.506)</i>	<i>(2.219)</i>	<i>(6.387)</i>	<i>N/A</i>	<i>(1.588)</i>	<i>N/A</i>
Inflow Control	0.546	0.457	0.992	0.907	0.692	0.221	0.532	0.596	0.739	0.371	0.339
<i>(Std. Dev.)</i>	<i>(0.248)</i>	<i>(0.315)</i>	<i>(0.026)</i>	<i>(0.018)</i>	<i>(0.047)</i>	<i>(0.125)</i>	<i>(0.031)</i>	<i>(0.123)</i>	<i>(0.068)</i>	<i>(0.025)</i>	<i>(0.094)</i>
Outflow Control	0.739	0.575	0.985	0.975	0.589	0.282	0.550	0.560	0.553	0.853	0.450
<i>(Std. Dev.)</i>	<i>(0.222)</i>	<i>(0.140)</i>	<i>(0.036)</i>	<i>(0.042)</i>	<i>(0.062)</i>	<i>(0.267)</i>	<i>(0.100)</i>	<i>(0.269)</i>	<i>(0.013)</i>	<i>(0.074)</i>	<i>(0.181)</i>

Table 2.1b: Descriptive Statistics in 8 Developed Countries

This table shows the mean value of each variable. Standard deviation lists in parentheses. The European Union is excluded in the sample. The capital flows include net FDI inwards/GDP, net FDI outwards/GDP, and net FPI inwards/GDP. The financial development is measured by stock traded/GDP and domestic credit/GDP. The Int'l Reserve Growth measures macroeconomic policies of reserve accumulation. The real interest rates are collected from WDI. This study also describes capital restrictions on inflows and outflows from 2002 to 2015 based on a new measure of capital control (Fernández et al., 2016).

	Australia	Canada	France	Germany	Italy	Japan	U.K.	U.S.
FDI Net Inward/GDP	3.322	3.518	2.139	2.449	0.952	0.183	4.355	1.711
<i>(Std. Dev.)</i>	<i>(2.186)</i>	<i>(2.416)</i>	<i>(1.169)</i>	<i>(2.913)</i>	<i>(0.604)</i>	<i>(0.164)</i>	<i>(3.271)</i>	<i>(0.639)</i>
FDI Net Outward/GDP	1.203	3.827	3.921	2.974	1.556	1.610	4.648	2.144
<i>(Std. Dev.)</i>	<i>(2.020)</i>	<i>(1.247)</i>	<i>(2.858)</i>	<i>(1.306)</i>	<i>(0.993)</i>	<i>(0.794)</i>	<i>(5.776)</i>	<i>(0.726)</i>
FPI Net Inward/GDP	0.796	0.603	1.248	0.537	0.272	0.008	2.419	0.898
<i>(Std. Dev.)</i>	<i>(1.225)</i>	<i>(0.949)</i>	<i>(1.572)</i>	<i>(1.426)</i>	<i>(0.733)</i>	<i>(0.011)</i>	<i>(4.888)</i>	<i>(0.801)</i>
Stock Traded/GDP	81.054	79.924	62.792	55.308	55.900	84.755	94.353	222.965
<i>(Std. Dev.)</i>	<i>(28.902)</i>	<i>(16.474)</i>	<i>(20.053)</i>	<i>(24.358)</i>	<i>(21.806)</i>	<i>(34.001)</i>	<i>(26.166)</i>	<i>(51.792)</i>
Domestic Credit/GDP	113.899	152.359	87.963	95.419	80.539	181.386	153.328	184.085
<i>(Std. Dev.)</i>	<i>(15.505)</i>	<i>(31.089)</i>	<i>(8.896)</i>	<i>(12.052)</i>	<i>(12.243)</i>	<i>(9.519)</i>	<i>(25.874)</i>	<i>(12.323)</i>
Int'l Reserve /GDP	0.041	0.038	0.020	0.020	0.020	0.184	0.024	0.007
<i>(Std. Dev.)</i>	<i>(0.013)</i>	<i>(0.007)</i>	<i>(0.004)</i>	<i>(0.005)</i>	<i>(0.005)</i>	<i>(0.055)</i>	<i>(0.007)</i>	<i>(0.002)</i>
Real Interest Rate	3.829	1.985	4.939	4.662	3.580	2.425	0.953	2.889
<i>(Std. Dev.)</i>	<i>(1.651)</i>	<i>(1.498)</i>	<i>(0.940)</i>	<i>(2.325)</i>	<i>(0.618)</i>	<i>(1.328)</i>	<i>(1.924)</i>	<i>(1.634)</i>
Inflow Control	0.278	0.100	0.003	0.064	0.000	0.000	0.007	0.100
<i>(Std. Dev.)</i>	<i>(0.037)</i>	<i>(0.000)</i>	<i>(0.013)</i>	<i>(0.049)</i>	<i>(0.000)</i>	<i>(0.000)</i>	<i>(0.026)</i>	<i>(0.000)</i>
Outflow Control	0.314	0.000	0.089	0.257	0.050	0.000	0.000	0.182
<i>(Std. Dev.)</i>	<i>(0.146)</i>	<i>(0.000)</i>	<i>(0.056)</i>	<i>(0.198)</i>	<i>(0.000)</i>	<i>(0.000)</i>	<i>(0.000)</i>	<i>(0.024)</i>

Table 2.2: Correlation Matrix

	Stock Traded/GDP	Domestic Credit/GDP	World GDP Growth	Crude Oil	Real Interest Rate	Reserve Accumulation Growth	Capital Restriction
Stock Traded/GDP	1.000						
Domestic Credit/GDP	0.598	1.000					
World GDP Growth	0.045	-0.016	1.000				
Crude Oil	0.042	0.003	0.715	1.000			
Real Interest Rate	-0.131	-0.075	-0.077	-0.072	1.000		
Reserve Accumulation Growth	-0.054	-0.112	0.128	-0.040	0.046	1.000	
Capital Restriction	-0.235	-0.258	0.009	-0.067	-0.269	-0.090	1.000

Granger Causality and FEVD

This section examines Granger causality between FDI/FPI inwards/GDP, financial development (stock traded/GDP and domestic credit/GDP), and world GDP. Panels A and B in Table 2.3a show that the inflows of FDI and FPI are significantly affected by shocks of stock traded and world GDP growth. However, Panels C and D show that domestic credit/GDP does not Granger cause FDI inflows.

The variance decompositions for the VAR model, presented in Table 2.3b, show how much of the forecast error for each variable can be influenced by exogenous shocks to the other variables. Panel A in Table 2.3b shows that the variation of FDI inflows is affected by 73.3% of itself after 5 years, 16.5% shocks of world GDP growth, and 10.3% shocks of stock traded/GDP. Panel B shows that the variation of FPI inflows is impacted by 65.2% of itself, 27.2% shocks of world GDP growth, and 7.6% shocks of stock trading. However, Panel C and D show that the shock of domestic credit/GDP has a minor effect on FDI/FPI inflows. In addition, the variations of world GDP growth, the stock traded/GDP and domestic credit/GDP are most affected by themselves (over 90%). Thus, the VAR models show that international capital flows are significantly affected by world business cycle and domestic stock-market liquidity. However, world business cycles have a stronger influence on capital flows than domestic financial development.

Table 2.3a: Granger Causality

The Granger causality is a statistical hypothesis for exploring whether each time series can forecast another. The model in Panel A examines a large number of hypotheses in the three-variable vector: world GDP growth, stock traded/GDP, and FDI inwards/GDP. Panel B tests a VAR model in three-variable vector: world GDP growth, stock traded/GDP, and FPI inwards/GDP. Panel C tests a VAR model in three-variable vector: world GDP growth, domestic credit/GDP, and FDI inwards/GDP. Panel D tests a VAR model in three-variable vector: world GDP growth, domestic credit/GDP, and FDI inwards/GDP. Based on the Bayesian information criterion (BIC), the appropriate one lag is selected in Panel A, three lags in Panel B, and two lags in Panel C and D.

Panel A	CHI ² /DF	P-value	Panel C	CHI ² /DF	P-value
World GDP Growth→Stock Traded/GDP	0.275/1	0.600	World GDP Growth→Domestic Credit/GDP	12.101/2	0.002
World GDP Growth→FDI Inflow/GDP	3.974/1	0.046	World GDP Growth→FDI Inflow/GDP	6.901/2	0.032
Stock Traded/GDP→World GDP Growth	0.410/1	0.522	Domestic Credit/GDP→World GDP Growth	6.633/2	0.036
Stock Traded/GDP→FDI Inflow/GDP	4.952/1	0.026	Domestic Credit/GDP→FDI Inflow/GDP	0.815/2	0.665
FDI Inflow/GDP→World GDP Growth	1.613/1	0.204	FDI Inflow/GDP→World GDP Growth	0.795/2	0.672
FDI Inflow/GDP→Stock Traded/GDP	2.073/1	0.150	FDI Inflow/GDP→Domestic Credit/GDP	0.381/2	0.827
Panel B	CHI ² /DF	P-value	Panel D	CHI ² /DF	P-value
World GDP Growth→Stock Traded/GDP	3.141/3	0.370	World GDP Growth→Domestic Credit/GDP	11.330/2	0.003
World GDP Growth→FPI Inflow/GDP	9.182/3	0.027	World GDP Growth→FPI Inflow/GDP	7.279/2	0.026
Stock Traded/GDP→World GDP Growth	42.61/3	0.000	Domestic Credit/GDP→World GDP Growth	6.552/2	0.038
Stock Traded/GDP→FPI Inflow/GDP	8.186/3	0.042	Domestic Credit/GDP→FPI Inflow/GDP	0.058/2	0.971
FPI Inflow/GDP→World GDP Growth	4.654/3	0.199	FPI Inflow/GDP→World GDP Growth	13.127/2	0.001
FPI Inflow/GDP→Stock Traded/GDP	13.731/3	0.003	FPI Inflow/GDP→Domestic Credit/GDP	1.352/2	0.508

Table 2.3b: FEVD

The FEVD investigates how much the forecast error variance of each variable can be influenced by exogenous shocks to the other variables. This study specifies the maximum steps or periods are five.

Panel A		World GDP	Stock	FDI	Panel C		World GDP	Domestic	FDI
Steps	Growth	Traded/GDP	Inflow/GDP	Steps	Growth	Credit/GDP	Inflow/GDP		
World GDP	1	1.000	0.000	0.000	World GDP	1	1.000	0.000	0.000
Growth	3	0.976	0.013	0.011	Growth	3	0.953	0.037	0.010
	5	0.972	0.015	0.013		5	0.927	0.063	0.010
Stock	1	0.022	0.978	0.000	Domestic	1	0.024	0.976	0.000
Traded/GDP	3	0.036	0.955	0.009	Credit/GDP	3	0.091	0.908	0.001
	5	0.037	0.950	0.013		5	0.093	0.903	0.004
FDI	1	0.047	0.005	0.948	FDI	1	0.039	0.002	0.958
Inflow/GDP	3	0.158	0.071	0.771	Inflow/GDP	3	0.159	0.003	0.838
	5	0.165	0.103	0.733		5	0.173	0.003	0.824
Panel B		World GDP	Stock	FPI	Panel D		World GDP	Domestic	FPI
Steps	Growth	Traded/GDP	Inflow/GDP	Steps	Growth	Credit/GDP	Inflow/GDP		
World GDP	1	1.000	0.000	0.000	World GDP	1	1.000	0.000	0.000
Growth	3	0.855	0.129	0.015	Growth	3	0.919	0.043	0.038
	5	0.878	0.109	0.013		5	0.897	0.064	0.040
Stock	1	0.000	1.000	0.000	Domestic	1	0.028	0.972	0.000
Traded/GDP	3	0.012	0.924	0.064	Credit/GDP	3	0.070	0.929	0.001
	5	0.030	0.902	0.068		5	0.063	0.936	0.001
FPI	1	0.029	0.060	0.912	FPI	1	0.002	0.010	0.987
Inflow/GDP	3	0.160	0.066	0.774	Inflow/GDP	3	0.029	0.010	0.961
	5	0.272	0.076	0.652		5	0.032	0.011	0.957

Results of Regressions

Table 2.4 shows effects of pull-push drivers on international capital flows in G20 countries from 2000 to 2015. Table 2.5a examines capital flows in 8 emerging countries (i.e. Australia, Canada, France, Germany, Italy, Japan, the U.S. and the U.K.) and Table 2.5b examines capital flows in 11 emerging countries (i.e. Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey), respectively.

The domestic financial development can help absorb capital flows and deal with their volatility, so this study proposes that the liquidity provided by stock-markets and banks will significantly impact capital flows. Table 2.4 shows that the liquidity of stock-markets is positively associated with FDI and FPI flows. In the literature, some studies show that the liquidity of stock-markets positively influences capital inflows (Brennan & Cao, 1997; Froot et al., 2001). It seems plausible that foreign investors are attracted by liquid stock-markets. The high liquidity of stock-market enhances investors' capacity to materialize potential gains quickly and at low costs. Alternatively, countries with high liquidity in stock-markets are also likely to invest abroad to diversity portfolio risks and seek higher-return investments.

Moreover, columns (1) and (7) of Table 2.4 shows that the interaction effects terms (stock traded/GDP * country classification) have significant effects on FDI outflows and FPI inflows, suggesting effects of stock-market liquidity on capital flows work differently between advanced and emerging economies. Tables 2.5a and 2.5b split the sample into advanced and emerging countries. These results show that there are some positive effects between stock-market liquidity and capital flows in developed economies in Table 2.5a. In contrast, columns (9) and (10) in Table 2.5b show that stock-market liquidity is only positively related to capital outflows, suggesting emerging countries tend to increase capital outflows when stock-markets are well-

developed. Domestic financial development in emerging countries has no significant spillover effects on capital inwards.

Under financial integration, local banks can seek funding from foreign portfolio investors, foreign direct investors, inter-bank markets, money markets, and international bond issues. Thus, some studies show that domestic credit growth is affected by international capital flows (Bruno & Shin, 2013; Lane & McQuade, 2014). Some empirical evidence shows that FDI flows flood into domestic banks and markets when domestic credit grows slowly. However, if foreign firms can borrow heavily from local banks, domestic credit may crowd out foreign capital inflows (Harrison & McMillan, 2003). However, this study does not find the significant relationship between domestic credit and capital flows in Table 2.4.

Push factors are also important drivers of capital flows. Columns (1), (2), (4) and (5) in Table 2.4 shows that world GDP growth significantly impacts international capital flows. Along with the good development of global economy, all countries tend to expand their international capital flows. Forbes and Warnock (2012) explain capital flow waves: surges, stops, flight, and retrenchment. They find that a large number of investments moved from developed countries to emerging countries since the GDP and global stock-markets increased rapidly in some emerging countries from 2000 to 2007. After 2010, global economic development slowed down and the U.S. dollar became stronger while investments flowed back to advanced economies. At present, global FDI is expected to decline due to the fragility of the global economy and the president weakness of aggregate demand. This study controls for the 2007-2009 financial crisis. The negative relationship between financial crisis and capital flows suggests all countries tend to reduce capital inflows and outflows during the financial crisis.

Fluctuations in oil price also affect foreign capital flows. The G20 members, such as Russia, Saudi Arabia, Canada, and Latin America, are main oil-exporting countries. Columns (2) and (4) in Table 2.5b shows that the oil price has a positive effect on capital flows in emerging countries. For the Russia economy, in particular, some studies show that the oil and gas sector accounts for 30% FDI (Fang & You, 2014). FDI in Russia has been adversely affected by the fall of oil price since June 2014. However, fluctuations of oil price have insignificant effects on international capital flows in developed countries.

This study also controls for real interest rate, capital controls, and growth of reserve accumulation, which play a major role to avoid excessive imbalances in central banks and intervene foreign exchange rates, thus affecting capital flows. Columns (1) and (2) in Table 2.5a show negative relationship between capital inwards and real interest rate, suggesting that advanced economies attract more FDI inwards when they lower their interest rate. In contrast, in the emerging countries, real interest rate is not related to FDI inwards and outwards. However, the positive relationships between real interest rate and FPI inwards in columns (5) and (6) indicate that a raising interest rate may increase short-term FPI inwards in emerging countries.

Moreover, compared with developed countries, emerging countries have higher capital reserves and capital controls. Since most emerging countries have inefficient capital markets and low levels of capital development, governments need foreign exchange reserves to help them stabilize their currencies. Table 2.5a shows that capital controls and growth of reserve accumulation have no significant influence on capital flows in developed countries. Column (5) in Table 2.5b shows that reserve accumulation growth is positively related to FPI inwards in emerging countries, suggesting the changes of macroprudential policies have a significant effect on short-term FPI inwards. In addition, Tables 2.4, 2.5a and 2.5b show that capital account

restrictions have on significant effects on capital inwards. However, Table 2.4 and 2.5b shows that capital restrictions significantly mitigate FDI outwards in emerging countries.

Conclusions and Implications

With the rapid development of globalization, the rise of emerging countries, regional cooperative organizations and multilateral activities, international capital flows don't simply move from rich (advanced) with the relatively high capital-to-labor ratio to poor (emerging) with relatively low rates. IMF's report on foreign direct investment in emerging market countries in 2003 shows that some certain general factors consistently determine which emerging countries attract the most FDI. First, market size and growth prospects of the host country significantly affect investment location because FDI emerging countries are increasingly being undertaken to serve domestic demand rather than to tap cheap labor. Second, the wage-adjusted productivity of labor and availability of infrastructure are still the main factors that influence the FDI. Third, legal protection for investors and institution quality are especially important factors when investors decide on whether to enter a new country.

This study contributes to the existing body of knowledge in an attempt to explore some drivers of international capital flows such as 1) domestic financial development (i.e. domestic stock traded and domestic credit provided by banks), 2) some external factors (i.e. world GDP growth and crude oil fluctuation), and 3) some control variables such as, real interest rate, capital restrictions, and reserve accumulation growth. The domestic development of stock-market has a significant spillover effect on international capital inflows and outflows, especially in developed countries. In emerging countries, capital inflows and outflows are highly influenced by levels of capital openness and governance policies, while this study still finds that emerging countries with well-developed stock-markets significantly increase capital outflows.

Table 2.4: Results of GMM Regressions in G20 Countries

The system GMM regressions are used to examine all hypotheses. The dependent variables are FDI inwards/GDP, FDI outwards/GDP, and FPI inwards/GDP. The pull factors are measured by stock traded/GDP and domestic credit by banks/GDP. The push factor is measured by world GDP growth and price of WTI crude oil. The models control for a lagged dependent variable, the stock traded/GDP, and domestic credit provided by banks as endogenous variables. The rest of independent variables are exogenous. The null hypothesis of Sargan test is that the instruments are valid instruments. The null hypothesis of Arellano-Bond test is no autocorrelation in the second order. Robust P-value in parentheses *** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	FDI Inwards	FDI Inwards	FDI Inwards	FDI Outwards	FDI Outwards	FDI Outwards	FPI Inwards	FPI Inwards	FPI Inwards
A Lagged Dependent Variable	0.426*** (0.000)	0.383*** (0.000)	0.392*** (0.002)	0.496*** (0.000)	0.448*** (0.000)	0.386*** (0.000)	0.389** (0.025)	0.326*** (0.001)	0.390** (0.022)
Stock Traded/GDP	0.081* (0.064)	0.204* (0.075)		0.399* (0.072)	0.600* (0.076)		0.251** (0.027)	0.142** (0.026)	
Stock Traded*Classification	-0.098* (0.072)			-0.359 (0.127)			-0.420*** (0.003)		
Domestic Credit			0.073 (0.804)			-0.096 (0.647)			0.035 (0.874)
Domestic Credit*Classification			-0.355 (0.258)			-0.245 (0.241)			-0.289** (0.040)
World GDP Growth	0.128** (0.019)	0.119** (0.042)		0.146* (0.067)	0.155* (0.060)		-0.042 (0.227)	0.059* (0.051)	
Crude Oil			0.023** (0.022)			0.024 (0.123)			-0.014 (0.411)
Real Interest Rate	-0.010* (0.052)	-0.021* (0.036)	-0.015* (0.085)	-0.005 (0.703)		-0.001 (0.958)	0.005 (0.619)		0.010 (0.205)
Reserve Accumulation Growth	0.535 (0.353)			-0.216 (0.693)			0.478 (0.346)		
Crisis 2007-2009 Dummy	-0.508* (0.062)	-0.209* (0.066)	-0.376* (0.060)	-0.444 (0.231)	-0.412 (0.191)	-0.490 (0.104)	0.035 (0.874)	-0.172 (0.338)	0.008 (0.963)
Capital Restriction			0.866 (0.182)			-1.305** (0.028)			-0.422 (0.321)
Observations	282	282	278	278	278	274	271	271	267
Number of countries	19	19	19	19	19	19	19	19	19
Sargan (P-value)	0.318	0.522	0.721	0.335	0.553	0.344	0.514	0.495	0.333
Arellano-Bond(2) (P-value)	0.503	0.325	0.381	0.666	0.625	0.368	0.318	0.332	0.494

Table 2.5a: Regression Analysis in Eight Developed Countries

The system GMM regressions are used to examine all hypotheses. This study assumes that capital flows and financial development are endogenous to the models and therefore capital flows are instrumented with lag 1. The dependent variables are FDI inwards/GDP, FDI outwards/GDP, and FPI inwards/GDP, respectively. The independent variables include stock traded/GDP, world GDP growth, and WTI oil price. Also, the models control for real interest rate, foreign exchange reserves, capital account restriction, and 2007-2009 financial crisis (dummy variable). Table 2.5a examines capital flows in 8 developed countries (i.e. Australia, Canada, France, Germany, Italy, Japan, the U.S. and the U.K.) Robust P-value is in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	FDI Inwards	FDI Inwards	FDI Outwards	FDI Outwards	FPI Inwards	FPI Inwards
A Lagged Dependent Variable	0.401** (0.012)	0.355** (0.044)	0.411*** (0.000)	0.381*** (0.001)	0.392** (0.045)	0.472* (0.078)
Stock Traded/GDP	0.376** (0.490)	0.197** (0.045)	0.005* (0.077)	0.119* (0.098)	0.006* (0.072)	0.025* (0.050)
World GDP Growth	0.353* (0.055)		0.196* (0.024)		0.094* (0.083)	
Crude Oil		0.028 (0.187)		0.046 (0.146)		-0.026 (0.107)
Real Interest Rate	-0.110* (0.074)	-0.134*** (0.008)	0.018 (0.867)	-0.017 (0.819)	0.003 (0.960)	0.002 (0.981)
Reserve Accumulation Growth	-0.860 (0.201)		-0.169 (0.872)		0.561 (0.650)	
Capital Restriction		3.658 (0.141)		-0.883 (0.670)		0.861 (0.526)
Crisis 2007-2009 Dummy	-0.696* (0.079)	-0.481* (0.077)	-0.958 (0.137)	-1.004 (0.120)	0.076 (0.879)	0.120 (0.809)
Constant	0.894 (0.176)	1.892** (0.017)	2.147*** (0.009)	2.341** (0.020)	0.467 (0.518)	0.485 (0.469)
Observations	117	104	117	104	117	104
Number of Countries	8	8	8	8	8	8
Sargan (P-value)	0.462	0.447	0.508	0.267	0.398	0.683
Arellano-Bond(2) (P-value)	0.485	0.426	0.344	0.488	0.182	0.150

Table 2.5b: Regression Analysis in Eleven Emerging Countries

The system GMM regressions are used to examine all hypotheses. This study assumes that capital flows and financial development are endogenous to the models and therefore capital flows are instrumented with lag 1. The dependent variables are FDI inwards/GDP, FDI outwards/GDP, and FPI inwards/GDP, respectively. The independent variables include stock traded/GDP, world GDP growth, and WTI oil price. Also, the models control for real interest rate, foreign exchange reserves, capital account restriction, and 2007-2009 financial crisis (dummy variable). Table 2.5b examines capital flows 11 emerging countries (i.e. Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey). Robust P-value is in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) FDI Inwards	(2) FDI Inwards	(3) FDI Outwards	(4) FDI Outwards	(5) FPI Inwards	(6) FPI Inwards
A Lagged Dependent Variable	0.573*** (0.004)	0.520*** (0.009)	0.727*** (0.000)	0.639*** (0.005)	0.181* -0.074	0.267** (0.022)
Stock Traded/GDP	-0.175 (0.473)	-0.095 (0.670)	0.215* (0.061)	0.178*** (0.011)	-0.002 (0.933)	0.027 (0.581)
World GDP Growth	0.166*** (0.007)		0.054** (0.018)		0.021* (0.053)	
Crude Oil		0.020*** (0.001)		0.033* (0.069)		-0.003 (0.252)
Real Interest Rate	0.006 (0.290)	0.008 (0.262)	-0.001 (0.866)	-0.005 (0.148)	0.011*** (0.003)	0.011** (0.031)
Reserve Accumulation Growth	-0.011 (0.980)		0.141 (0.581)		0.218** (0.047)	
Capital Restriction		0.821 (0.173)		-0.740** (0.023)		0.130 (0.458)
Crisis 2007-2009 Dummy	-0.388 (0.152)	-0.322 (0.242)	0.072 (0.482)	0.156 (0.208)	-0.077 (0.331)	-0.011 (0.755)
Constant	0.650 (0.326)	0.739 (0.213)	0.137 (0.315)	0.713*** (0.008)	0.043 (0.480)	-0.060 (0.546)
Observations	165	165	162	162	154	154
Number of Countries	11	11	11	11	11	11
Sargan (P-value)	0.502	0.547	0.408	0.393	0.211	0.391
Arellano-Bond(2) (P-value)	0.929	0.939	0.969	0.870	0.262	0.384

This study shows that capital flows have been impacted by the changes in the global economy, the world's oil price, and the U.S. interest rate. For example, the Brazilian economic recession of 2014-2017 is mainly impacted by slowing global economic growth and falling commodities prices weighed on FDI flows to emerging countries. According to a report from ECB Economic Bulletin (2016), the development of oil producers such as state-owned Petrobras accounts for 10% of total Brazilian investments and almost 2% of GDP. The firm had to reduce investments by 33% to adjust to the crash of oil price from 2014 to 2015. In addition, global investors suddenly sold off large shares of securities in emerging markets because the U.S. announced it would wind down asset purchases (the “taper tantrum”) in 2013. After December 2015, the U.S. Federal Reserve's began to raise interest rates. Brazil economy suffered capital outflows and entailed a surge in interest payments on public borrowing according to ECB (2016).

Capital account liberalization is an ultimate objective in the G7 countries, but a large number of developing nations in G20 need to liberalize gradually. History has taught us that the excesses of capital inflows into Mexico in 1994, Thailand in 1996-1997, and Russia 1998 became the roots of the domestic financial crisis and quickly spread to a global currency and equity markets. At the same time, the falling interest rates in the U.S. attracted investors to the high yields and high-growth economies in Asia and Latin America. Although some emerging countries have integrated into the global capital markets, for a long time, they will still need capital controls and macroprudential policies because their macroeconomic and domestic financial systems are not sufficiently strong to deal with the high volatility of capital flows. However, in the current global capital markets, capital controls and macroprudential policies in emerging countries also can incur the imbalance of capital flows between emerging and advanced economies. Thus, both

macro-prudential measures and capital flow management measures are key topics at the G20 Summit. The high volatility of capital flows and the imbalance of capital inflows can be more effectively addressed through well-directed and coordinated global collaboration.

CHAPTER III

COUNTRY DEMANDS AND FIRM CHOICES FOR CROSS-LISTING

Introduction

With the strength of trends in financial liberalization and integration of world economy since the 1970s, the international equity markets have developed rapidly. According to the market segmentation hypothesis, when a foreign firm operates in a segmented capital market, cross-listing is the best way to lower cost of capital. Investor recognition hypothesis argues that cross-listings impacts stock returns by attracting investor recognition, improving liquidity, and reducing the cost of capital. The bonding hypothesis implies that a firm from a country with low investor protections could lower the firm's cost of capital through bonding itself with the U.S. A recent research shows that the effect of bonding and market segmentation on cross-listing is mitigated in an increasingly integrated global capital market.

Most previous studies primarily focused on firm's motivations of cross-listing, but they rarely explore how cross-listing activities are associated with domestic country development. Also, few studies made clear how financial development influence cross-listing activities. Claessens et al. (2006) show that well-developed financial market will promote cross-listing activities. However, Levine and Schmukler (2007) show domestic financial development will mitigate cross-listing activities. Korczak and Korczak (2013) first propose a non-linear relationship: cross-listing activities increase first and then decrease as the domestic stock-market

develops. However, to the best of my knowledge, the previous studies didn't show the thresholds between local stock-market development and international stock-market activities. To fill this research gap, this study examines the threshold effects first and then shows the non-linear relationships between cross-listing activities and the liquidity of domestic stock-market by applying panel threshold models.

This study addresses another research question: why do firms choose different types of DRs? In the academic literature, a number of studies show the corporate decision on list shares on an overseas stock exchange (Karolyi, 1998). Different from previous studies on motivations of cross-listing, this study attempts to distinguish why firms or investors choose 1) GDRs or ADRs, 2) Level I or Level II&III ADRs, and 3) sponsored DRs and unsponsored DRs. Boubakri, Cosset, and Samet (2010) examine the determinants of firm's decision to issue one of the four ADR program (i.e. Level I, II, III, and Rule 144A). They find that firms from emerging markets and from countries with the weak legal protection of minority shareholders are more likely to choose Level III and Rule 144A after the enactment of the Sarbanes-Oxley (SOX) Act. This study further investigates determinants of firm's decision in more comprehensive DR programs. First, on the basis of comparison and event study, this essay discusses the difference in abnormal returns of domestic shares because of different choices of DRs. Second, it explains that how choices of DRs are affected by financial development, and it also controls for domestic disclosure index, political stability, cultural distance, and firm characteristics.

The findings of this research can contribute to international finance in several aspects. The essay first shows a threshold effect of financial development on country's demands for ADRs. When financial development is at a much lower stage, some countries have no explicit demands for cross-listing; when local stock-markets become well-developed, most countries have great

demands for cross-listings; however, after local stock-market develops at the very strong level, domestic financial development has less influence on demands of cross-listings. Second, this study supposes that foreign firms and investors might benefit differently depending on what types of DRs they choose. In the event study, the results show that developed countries earn positive abnormal returns around the ADR and GDR listing, but developing countries earn negative abnormal returns around GDR listing. Level I and unsponsored DRs bring positive abnormal returns to domestic shares, but Level II&III DRs come with some negative abnormal returns. Next, because the valuation of domestic stock price is affected by choices of DRs, this study mainly discusses whether choices of DRs are affected by some factors in the country and firm levels. Countries with lower financial development, worse disclosure requirements, political instability, and cultural similarity, are more likely to issue GDRs, Level II&III DRs, and sponsored DRs, which is consistent with the bonding and proximity hypotheses.

Literature Review and Hypothesis Development

Types of DRs

This section briefly introduces various categories of DRs. According to the levels of disclosure requirements, ADRs are divided into Level I (on the OTC markets), Level II, and Level III. With the global integration of the major securities markets, GDRs can be listed and cleared in more than one market, such as London's, Frankfurt's, Luxembourg's and Singapore's. The 144A GDR is a private placement offered for U.S. investors, but the Regulation S GDR is provided for international investors. Moreover, according to the sponsorship levels, DRs can be categorized into the SDR and UDR. The UDRs are issued by depositary banks in accordance with market demand and without the agreement of issues. The difference of SDR and UDR from

an economic point of view indicates that SDRs are derived from bidirectional demand between host and home markets, but UDRs are unilateral demand from U.S. markets.

Regulation Changes

The SEC regulation change is also significantly related to demands of ADRs. Some studies show foreign firms delisted ADRs or choose Level I instead of Level II&III because of a cost of disclosure over the benefits of cross-listing in the U.S. exchanges after the 2002 Sarbanes-Oxley Act (SOX) (Marosi & Massoud, 2008; Chaplinsky & Ramchand, 2012; You, Parhizgari, & Srivastava, 2012). However, Doidge, Karolyi, and Stulz (2009) show the decrease in ADRs related to SOX is explained by changes in firm characteristics rather than by variations in the benefits of ADRs. Moreover, Bessler et al. (2012) find the absence of valuation benefits are primary reasons of German firms' delisting from U.S. exchanges since the 2007 Rule 12h-6 was implemented⁶.

After 2007, SEC implemented automatic exemption (12g3-2(b)), which was designed to continue to attract foreign firms and investors to the U.S. markets⁷. Iliev et al. (2014) show that the regulation change did not achieve its intention of increasing SDRs in the over-the-counter (OTC) market by a reduction in compliance costs, but it motivated depository banks to create more involuntary UDRs for increasing banks' expected fee revenue⁸. In the existing literature, the UDR boom in 2008 has been little investigated because involuntary UDRs provide very limited benefits for ordinary share investors.

⁶ The Rule 12h-6 make easier for cross-listed firms to delist from U.S. markets.

⁷ The exemption permits foreign issuers to issue ADRs in OTC markets without registration under section 12(g). Also, it does not require the creation of new disclosure documents, but only require the translation into English of disclosure documents in a foreign language.

⁸ The UDRs are in accordance with market demand and without the agreement of underlying firms

Financial Development and Demands/Choices for DRs

Some previous studies show that the well-developed underlying financial market is associated with subsequent higher internationalization of stock-market activities (Domowitz et al., 1998; Claessens et al., 2006). However, the “migration and spillover” arguments show that international firms migrate from domestic markets to major international markets, suggesting international stock-markets could reduce the trading activity of domestic firms in emerging countries (Levine & Schmukler, 2007). Korczak and Korczak (2013) identify a non-monotonic relationship between local stock-market development and the demand for cross-listing. This study supposes that domestic financial development will not only impact the country’s demands for ADRs but also affect firm’s choices on different types of DRs, such as ADRs, GDRs, Level I, Level II, Level III, sponsored DRs, and unsponsored DRs.

Hypothesis 1a: There are non-linear relationships between country’s demands for ADRs and financial development.

Hypothesis 1b: firms and investors from countries with worse financial development are likely to issue GDRs, level II&III DRs, and sponsored DRs.

Firm’s choices on DRs

The market segmentation hypothesis shows cross-listing would mitigate barriers to capital flows, resulting in a lower cost of capital (Miller, 1999). Some empirical evidence shows if the international market is integrated, the risk premium in two markets will disappear; the share price would increase; and the expected return would decrease (Errunza & Miller, 2000; Bekaert & Harvey, 2002; Bekaert et al., 2002; Bekaert & Harvey, 2003). Moreover, the market liquidity hypothesis shows that cross-lists in the high liquidity markets could increase firms’ liquidity in home countries (Hales & Mollick, 2014). Furthermore, the investor recognition hypothesis

suggests that an increase in investor awareness of a firm valuation would reduce the expected returns. Foerster and Karolyi (1999) show that non-U.S. firms earn a cumulative abnormal return of 19 percent during the year before ADR listing and their studies support for market segmentation and investor recognition hypotheses. Different from the previous studies, this study supposes that changes of stock prices in domestic markets are associated with different types of DRs, such as GDRs, ADRs, Level I DRs, and Level II&III DRs.

Hypothesis 2: ADRs and Level I DRs are associated with higher cumulative abnormal returns.

The bonding hypothesis shows cross-listing acts as a bonding and monitoring mechanism to commit companies voluntarily to higher standards of corporate governance and provide a better investor protection. Cross-listing foreign firms, from poorer investor rights, would reduce agency costs and enhance growth opportunities (Doidge et al., 2004). In turn, when agency conflicts (or consumption of private benefits) are high, the foreign firms are less likely to choose to cross-list in the U.S. (Doidge, Karolyi, Lins, et al., 2009). The avoiding or signaling hypothesis shows that firms choose cross-listing since they don't have the intention to improve corporate governance, but they signal their better business quality and signal their ability to meet the higher disclosure requirements (Licht, 2003). However, some empirical studies show that countries with better legal protection and institutional quality tend to increase their cross-listing (Pagano et al., 2001; Aggarwal, Klapper, & Wysocki, 2005; Halling, Pagano, Randl, & Zechner, 2008; Chen, Chen, & Wei, 2009). Investors highly regard institutional quality and legal protection in a foreign country since a stable government and law system play a major role in the allocation of resources and protects them against expropriation risks (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000).

Hypothesis 3a: Country's demands for ADRs are positively associated with legal protection and institutional quality.

Hypothesis 3b: Foreign firms from countries with worse legal protection and institutional quality are more likely to choose GDRs, Level II&III DRs, and sponsored DRs.

Proximity preference also plays a major role in the choices of overseas listing venue (Pagano et al., 2001; Pagano et al., 2002; Sarkissian & Schill, 2004; Halling et al., 2008; Pan & Brooker, 2014). Sarkissian and Schill (2004) show that investors prefer to invest in close-to-home equities because investors are intolerant toward the unfamiliar geography, culture, and language. Dodd et al. (2015) show that firms cross-list in foreign markets with higher cultural homogeneity because 1) investors prefer to invest in culturally familiar firms and 2) managers and foreign investors tend to reduce potential conflicts with diverse cultures.

Hypothesis 4: Foreign firms are more likely to choose GDRs and Level II&III DRs when there is high cultural distance between home and host countries.

Data

This study first explores how country's demands of DRs are associated with domestic financial development (i.e. stock traded/GDP and domestic credits/GDP). The primary source of data is the ADR directory, which contains country, industries, DR exchanges, levels of ADRs, sponsorship, CUSIP, U.S. ISIN, and underlying ISIN program in the BNY Mellon and Citibank's websites. The data of domestic financial development is collected from World Development Indicators (WDI). We also control for legal protection and institutional quality from World Governance Indicators (WGI). This study explores all ADRs in 36 countries from

1990 to 2015⁹. Also, according to the ISIN in the DR directory, I collect all DR's firms including accounting and market data from Compustat Global.

For the country-level data, the first dependent variable is the number of ADRs, which are measured by counts of the total number of ADRs by a particular country in a given year. To run the robustness check, this study uses an alternative dependent variable: the total value foreign stocks sold to U.S. residents, which is collected from U.S. Department of the Treasury. The foreign stocks sold to U.S. residents include ADRs and other types of cross-listings. The independent variables and control variables include 1) the local stock-market development, which is measured by the ratio of stock traded to GDP from WDI and by the ratio of domestic credit provided by financial sector to GDP; 2) legal protection, which is measured by disclosure index using Doing Business database by the World Bank from 2005 to the present; 3) institutional quality, which is measured by using WGI indexes: political stability and the rule of law; 4) Chinn-Ito index, which is used to measure a country's degree of capital account openness. 5) six dimensions of national culture: power distance index, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance index, long-term orientation versus short-term normative orientation, and indulgence versus restraint from Geert Hofstede website available at <http://geerthofstede.com/research-and-vsm/dimension-data-matrix/>;

For the firm-level data, the event study tests the stock returns for specific firms before and after the cross-listing. This study collects 1,487 firms issued DRs in developed countries and 668 firms in emerging countries from Compustat Global. Based on the DR dictionary, all DR firms are classified into three groups: ADRs & GDRs, Level I, II & III, and sponsored and

⁹ According to the directory of depository receipts provided by BNY Mellon, the total DR programs of firms located in 77 countries from January, 1990 to December, 2015. This study excluded 41 countries with less than 10 ADR programs from 1990 to 2015.

unsponsored DRs. For the market data, firms' stock returns are collected from Compustat Global. Also, this study collects domestic stock-market indexes (benchmarks) from DataStream. Moreover, this study measures firms' performance by using return on assets (ROA) and firm size by using a total number of employees.

Methodology

Panel Threshold Model

This section examines how countries' demands for ADRs are affected by stock-market development, local legal protection, local institutional quality, and financial account openness. The statistical model of counts (fixed-effected Poisson model) is used to estimate the linkages between the aggregate country demands for ADRs and country-level variables in the context of panel data. OLS is not appropriate for intrinsically integer-valued data since it assumes that true values are normally distributed. Moreover, according to the literature review, there is another important non-monotonic relationship between the underlying financial market development and demand for ADRs. In Korczak and Korczak (2013)'s study, they add the square of the market development measures into the model and find that cross-listing demand first grows and then decreases as the local market develops. This study applies threshold regression methods for non-dynamic panels with individual fixed effects (Hansen, 1999) to estimate the non-linear effects between underlying stock-market development and the demand of ADRs. The threshold model is shown in the following equation:

$$DEMAND_{it} = \alpha_0 + \alpha_1 ST_{it} + \alpha_2 ST_{it} \cdot I(ST_{it} < \gamma_1) + \alpha_3 ST_{it} \cdot I(\gamma_1 \leq ST_{it} \leq \gamma_2) + \alpha_4 ST_{it} \cdot I(ST_{it} > \gamma_2) + \alpha_5 KAOPEN_{it} + \alpha_6 DI_{it} + \alpha_7 IQ_{it} + f_i + y_t + e_{it}, \quad (1)$$

where $i = 1, 2, \dots, 36$ countries and $t = 1990, 1991, \dots, 2015$; $DEMAND_{it}$ indicates 1) demands for ADRs each country per year and 2) the growth of foreign sales of stocks to U.S. residents (included total ADRs and other cross-listings); ST_{it} is stock traded to GDP, $I(FD_{it} < \gamma_1)$ represents

the threshold of stock traded is less than the threshold γ_1 ; $I(\gamma_1 \leq FD_{it} \leq \gamma_2)$ accounts for the threshold of stock traded is between the threshold γ_1 and γ_2 ; $I(FD_{it} < \gamma_1)$ accounts for the threshold of stock traded is greater than the threshold γ_2 ; $KAOPEN_{it}$ is capital account openness; DI_{it} is protecting minority investors - extent of disclosure index; IQ_{it} is institutional quality, which includes the rule of law and political stability; f_i is the fixed effect, and y_t is year effects. The sample includes 21 developed countries and 15 emerging countries from 1990 to 2015. The 21 developed countries include Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the U.K. The 15 emerging countries include Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Korea, Philippines, Poland, Russia, South Africa, Thailand, Turkey, and Mexico.

The advantage of the threshold model is to determine the unknown cut-off value (stock traded/GDP) efficiently and avoid the biases caused by the subjective judgments. First, this study estimates Eq. (1) under the alternative model and save the residuals \hat{e}_{it}^* and group these residuals by the individual $\hat{e}_i^* = (\hat{e}_{i1}^*, \hat{e}_{i2}^*, \dots, \hat{e}_{it}^*)$. Second, this study creates bootstrap sample under the null hypothesis by using above errors. Third, this study estimates the null model $y_{it}^* = x_{it}^* \beta_1^* + \varepsilon_{it}^*$ and alternative model $y_{it}^* = x_{it}^*(\gamma) \beta_1^* + \varepsilon_{it}^*$ and calculate the likelihood ratio $LR_1(\gamma) = \frac{S_1(\gamma) - S_1(\hat{\gamma})}{\sigma^2}$ by using the bootstrap sample. Finally, this study repeats above steps for 200 times to determine the percentage of draws for which the stimulated $LR_1(\gamma)$ exceeds the actual $F_1 = \frac{S_0 - S_1(\hat{\gamma})}{\sigma^2}$ and the threshold of statistical significance $p - value = \frac{1}{200} \sum_{bs=1}^{200} 1\{LR_{bs}(\gamma) > F_1\}$.

This section investigates what factors affect countries' demands on different types of DRs. The first hypothesis is that demands of cross-listings are associated with domestic financial development. I hypothesize that countries' demands of DRs grow as the domestic financial market develops, but there is a non-linear relationship between financial development and demand for ADRs. When the liquidity of a local stock-market is very low, some countries or firms might have no explicit demands for cross-listing. As liquidity of a local stock-market increase, most countries will raise its demands for cross-listing. When the liquidity of a stock-market is too strong, a country will slow the growth in demands for cross-listings. Second, according to the bonding and market segmentation hypothesis, this study controls for disclosure index, institutional quality, and capital account openness index.

Abnormal Return

Some studies find significant abnormal returns during the year before cross-listing (Foerster & Karolyi, 1999; Stulz, 1999). This section examines whether abnormal returns differ depending on the different choices of DRs. This study employs the market model to estimate expected stock returns and abnormal returns as following:

$$R_{it} = \alpha + \beta R_{mt} + \varepsilon_{it} \quad (2)$$

where α and β are regression parameters; R_{it} is observed return on the security i in period t ; R_{mt} is the local index returns. Once the parameters are estimated in Eq (3), the expected returns, denoted as (\hat{R}_{it}) are then estimated using the estimated parameters. The abnormal return is the difference between actual and expected returns.

$$AR_{it} = R_{it} - \hat{R}_{it} \quad (3)$$

Once the abnormal returns are estimated, the cross-section average abnormal returns are estimated as follows:

$$AAR_t = \sum_{i=1}^n AR_{it} / n, \text{ where } n \text{ is the total number of firms} \quad (4)$$

Finally, sum the average abnormal returns over the T days in the event window to form the cumulative average abnormal return (CAAR).

$$CAAR_T = \sum_{t=1}^T AAR_t \quad (5)$$

In event studies, some studies show that foreign firms earn abnormal returns during the year before cross-listing, but incur a loss during the year following cross-listing. In the literature, most studies apply market segmentation, investor recognition, and bonding theories to explain the effects of cross-listings on stock returns. However, this study hypothesizes that various types of DRs have different effects on stock returns. In the emerging countries, all types of sponsored DRs will be good news for investors to earn abnormal returns during the year before cross-listing. In contrast, in the developed countries, level I ADRs and GDRs have fewer impacts on stock returns, but the issues of Level II&III ADRs bring positive abnormal returns for investors during the year before cross-listing.

Regression Analysis

In the literature, most studies argue that the motivations of cross-listing are the market segmentation, investor recognition, bonding hypothesis, and so on. Different from these previous works, this section discusses whether foreign firm's choices in 1) ADRs or GDRs, 2) Level I or Level II & III, and 3) sponsored or unsponsored DRs are impacted by domestic financial development, local disclosure requirements, institutional quality, cultural distance, firm's characteristics, and abnormal return.

$$\begin{aligned} CHOICES_i = & \beta_0 + \beta_1 CREDIT_i + \beta_2 TRADED_i + \beta_3 DISC_i + \beta_4 INST_i \\ & + \beta_5 CUL_i + \beta_6 ROA_i + \beta_7 EMP_i + \beta_8 CAAR_i + e_i, \end{aligned} \quad (6)$$

where i indicates all foreign firms; $CHOICES_i$ indicates choices on either ADRs or GDRs and choices on either Level I or Level II & III. $CREDIT_i$ is domestic credit provided by banks to GDP; $TRADED_{it}$ represents stock traded to GDP; $DISC_i$ is the local disclosure index; $INST_i$ is the institutional quality, which is measured by political stability; CUL_i is the cultural distance; ROA_i measures firm's performance; EMP_i is the natural logarithm of a total number of employees; CAR_i is the cumulative average abnormal return.

To the best of my knowledge, few studies explain why foreign firms choose different types of DRs, such as 1) ADRs and GDRs, 2) level I, II, and III DRs, and 3) sponsored and unsponsored DRs. This study first examines whether choices of DRs are impacted by domestic financial development. This study hypothesizes that foreign firms in countries with weak financial development are more likely 1) to choose GDRs rather than ADRs, 2) to choose Level II&III ADRs, and 3) to be associated with sponsored DRs. Halling et al. (2008) show that cross-listings occur in the U.S. capital markets tends to be larger for firms from countries that are geographically close to the U.S. and feature low financial development. Moreover, weak financial development generally constrained the ability of foreign firms to access external capital, innovate, and expand. Thus, sponsored DRs and Level II&III DRs are necessary to increase liquidity, reduce the cost of capital, and increase investor base for foreign firms from countries with weak financial development. However, Level I and unsponsored DRs are being seen as good portfolio diversifier for institutional investors.

The model (6) also controls for disclosure index, political stability, cultural distance, firm's performance, and numbers of employeses. Some studies show that foreign firms from emerging countries with the weak legal protection of minority shareholders are likely to choose Rule 144a GDRs and Level III DRs (Boubakri et al., 2010). In addition, some studies show that foreign

firms from countries with weak political institutions are more likely to cross-list in the U.S. via the over-the-counter market and less likely to cross-list on one of the U.S. exchanges. Moreover, Dodd et al. (2015) show that the role of culture significantly affects cross-listing decisions.

Variable Construction

This study measures proximity preferences in some aspects, such as language, geographic distance, cultural distance, and legal system. To measure cultural distance, I apply exploratory factor analysis (EFA) to uncover the underlying structure of a relatively large set of variables: six dimensions of national culture. The purpose of EFA is to reduce the number of items in predictive regression models and eliminate problems of multicollinearity. The results of EFA show that all dimensions of national culture load significantly into on a single factor. And then, this study calculates the culture distance between U.S. and home countries based on Hofstede cultural dimensions (Dodd et al., 2015).

$$\text{Cultural Distance } (CD_{ij}) = \sqrt{\sum_{k=1}^6 \{(I_{kj} - I_{ki})^2 / V_k\}} \quad (7)$$

where the CD_{ij} is calculated based on six dimensions (k) by Geert Hofstede; I_{kj} is home country j 's score on the k th culture dimension; I_{ki} is U.S. i 's score on the k th culture dimension; V_k is the variance of the score of the dimension.

Results

Descriptive Statistics

This study compares all types of DRs from 1990 to 2015 between developed and emerging countries. In Figure 3.1, all kinds of DRs grow at a relatively slow rate before 2007, but ADRs boom after 2007. Due to the rule of deregistration for foreign investors after 2007, ADRs grow strongly again. Specifically, the unprecedented demands for ADRs after 2007 are mainly derived from the growth of UDRs in the OTC markets. Demands of UDRs are higher in developed

countries than in emerging countries. Especially, the demand for UDRs grows rapidly in developed countries, such as Japan, New Zealand, Switzerland, Italy, Hong Kong, Singapore, etc. However, a more interesting finding is that demands of UDRs are extremely high in some rapid growing Asian countries, such as Indonesia, Thailand, Philippines, and China.

Furthermore, the growth of Level I ADRs is higher than the growth of Level II & III ADRs.

Developed countries have more Level I ADRs than emerging countries, but emerging countries have more Level II & III ADRs. Finally, emerging countries such as India, Russia, and Brazil, are more likely to issue all types of GDRs than developed countries. The annual demand of GDRs is less than the demand of ADRs in total. However, from 2004 to 2007, no-U.S. companies increasingly raised capital through GDRs because internal financial control report requirements under SOX began to apply foreign issues during 2006.

Table 3.1a and 3.1b show the mean values on the number of ADRs per year, foreign sales of stocks to U.S. residents to GDP, financial development, capital openness, institutional quality, and cultural distance for 21 developed countries and 15 emerging countries. First, in the developed countries, some countries have high disclosure requirements, such as Belgium, Israel, Japan, New Zealand, Singapore, Switzerland, and the U.K., and some countries have very low disclosure requirements, such as Australia, Austria, France, Germany, Netherlands, and Spain. However, most emerging countries have lower disclosure requirements, except for Colombia, South Africa, and Thailand. Second, developed countries have much better institutional qualities than emerging countries. Third, banks in developed countries have higher borrowing capacity provided to domestic firms than banks in emerging countries. Fourth, the liquidity of stock-market differs greatly in all countries. There is very high liquidity in Singapore, Switzerland, Korea, and South Africa, but very low in Argentina, Chile, Colombia, Indonesia, Philippines,

Poland, Mexico, Austria, Ireland, and New Zealand. Fifth, because developed countries have a higher level of financial liberalization than emerging countries, they have more sales of stocks to U.S. and ADRs, such as in Australia, France, Germany, Japan, Netherlands, Singapore, Sweden, Switzerland, and the U.K. In contrast, all emerging countries have fewer sales of stocks to U.S., but some countries issue more ADRs, such as in Brazil, China, and South Africa.

Figure 3.1: The Trends of All Types of DRs

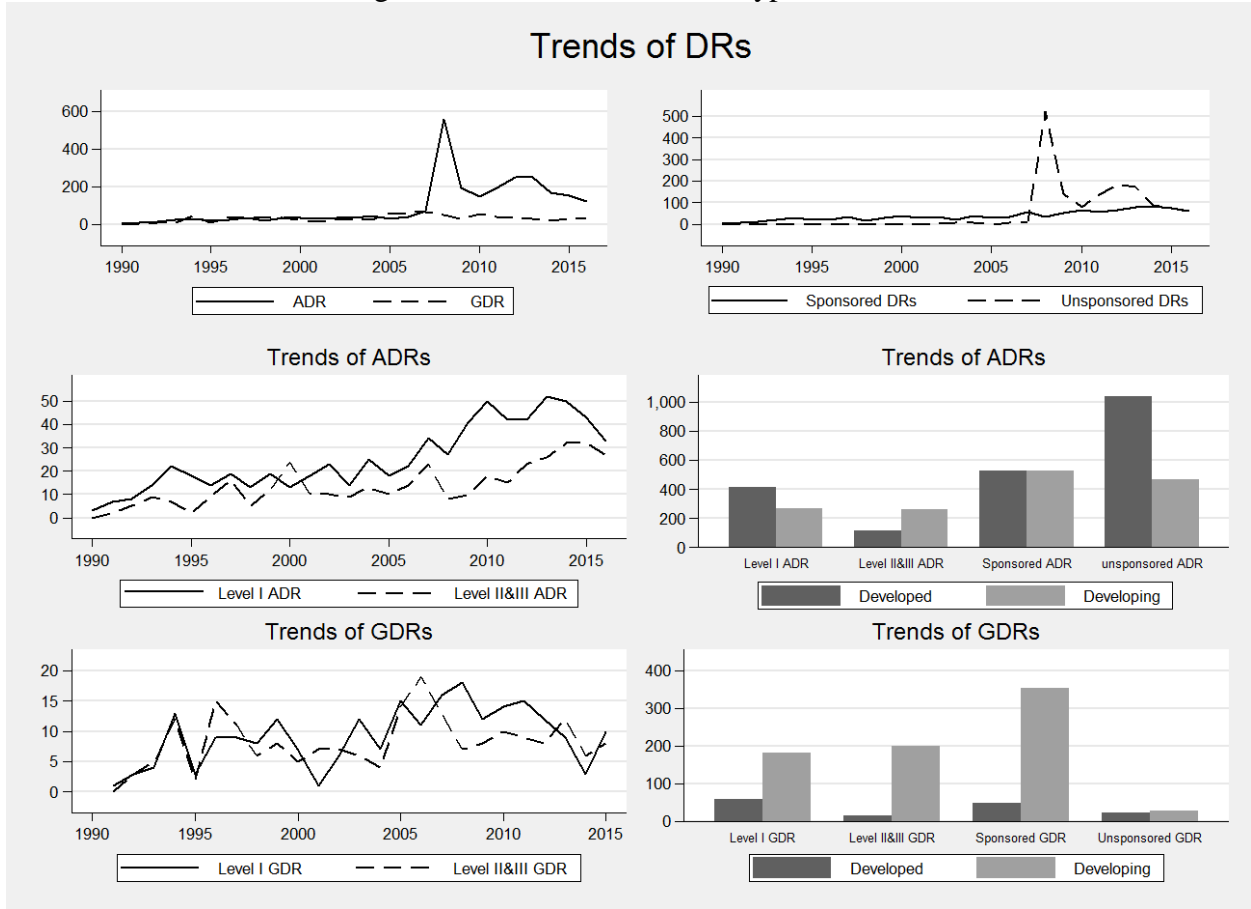


Table 3.1a: Descriptive Statistics in 21 Developed Countries

This section shows mean value of each item in 21 developed countries. The disclosure index, political stability, and the rule of law are collected from WGI between 2005 and 2015. The stock traded/GDP and domestic credit provided by financial sector/GDP are collected from WDI from 1990 to 2015. The openness is capital account openness (Chinn-Ito index). The culture distance is the cultural differences between domestic countries and the U.S. The foreign stocks indicate foreign sales of stocks to U.S. residents/GDP. ADRs per year show the average ADR listings per year for each country

	Australia	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Israel	Italy
Disclosure Index	0.16	-0.15	0.95	0.60	0.20	0.17	-0.16	-0.87	0.35	1.79	0.39
Political Stability	0.98	1.17	0.86	1.11	1.44	0.52	0.91	0.25	1.15	-1.27	0.56
Rule of Law	1.66	1.52	1.27	1.80	1.77	1.14	1.52	0.72	1.70	1.10	0.86
Stock Traded/GDP	60.63	10.00	17.70	22.88	52.45	45.66	46.56	21.10	12.01	23.66	39.03
Bank Credit/GDP	96.74	92.55	62.00	117.02	75.01	87.61	96.05	64.40	92.56	68.29	70.99
GDP Growth	3.09	1.97	1.80	1.49	1.61	1.57	1.63	0.90	5.61	4.48	0.72
Openness	0.81	0.96	0.96	0.99	0.96	0.94	1.00	0.76	0.92	0.42	0.94
Cultural Distance	0.09	0.61	1.63	0.45	0.49	1.62	1.38	2.01	0.07	N/A	1.58
Foreign Stocks	5.40	0.52	0.20	1.90	1.89	2.57	1.17	0.38	1.17	2.51	0.72
ADRs Per Year	7.65	0.96	0.96	1.07	0.96	3.96	4.00	0.80	0.84	1.15	2.23
	Japan	Netherlands	New Zealand	Norway	Portugal	Singapore	Spain	Sweden	Switzerland	U.K.	
Disclosure Index	0.98	-0.48	2.57	0.82	0.39	2.36	0.03	0.34	1.28	1.57	
Political Stability	1.00	1.09	1.28	1.27	0.97	1.14	0.01	1.21	1.31	0.49	
Rule of Law	1.02	1.79	1.81	1.43	1.02	1.96	1.14	1.63	1.66	1.78	
Stock Traded/GDP	62.76	72.12	8.52	32.19	21.17	95.15	78.83	57.30	127.65	74.62	
Bank Credit/GDP	189.38	103.70	106.45	92.13	108.38	98.81	116.00	82.00	153.32	133.80	
GDP Growth	1.18	2.09	2.72	2.41	1.38	6.18	2.06	2.09	1.62	1.96	
Openness	0.99	1.00	1.00	0.88	0.91	0.98	0.89	0.94	1.00	1.00	
Cultural Distance	2.31	0.32	0.21	0.24	2.15	2.07	1.64	0.17	N/A	0.09	
Foreign Stocks	4.41	4.69	0.32	2.45	0.56	10.93	0.95	5.95	9.23	36.34	
ADRs Per Year	9.5	0.96	1.46	1.07	0.65	2.23	1.53	2.23	2.11	10.88	

Table 3.1b: Descriptive Statistics in 15 Emerging Countries

This section shows mean value of each item in 15 emerging countries. The disclosure index, political stability, and the rule of law are collected from WGI between 2005 and 2015. The stock traded/GDP and domestic credit provided by financial sector/GDP are collected from WDI from 1990 to 2015. The openness is capital account openness (Chinn-Ito index). The culture distance is the cultural differences between domestic countries and the U.S. The foreign stocks indicate foreign sales of stocks to U.S. residents/GDP. ADRs per year indicates the average ADR listings per year for each country.

	Argentina	Brazil	Chile	China	Colombia	India	Indonesia	Korea
Disclosure Index	-0.20	0.04	0.68	-0.34	1.16	0.38	0.24	0.53
Political Stability	-0.12	-0.14	0.53	-0.47	-1.68	-1.15	-1.19	0.32
Rule of Law	-0.57	0.13	1.47	-0.24	0.20	-0.36	-0.33	0.82
Stock Traded/GDP	5.63	20.89	11.74	70.85	3.96	40.91	10.69	91.95
Domestic Credit/GDP	16.16	49.07	74.77	110.36	35.14	35.70	36.21	98.20
GDP Growth	3.41	2.51	4.86	9.74	3.73	6.52	5.12	5.18
Openness	0.40	0.27	0.51	0.15	0.27	0.16	0.74	0.43
Cultural Distance	1.06	1.69	1.49	2.91	1.39	2.13	2.52	1.29
Foreign Stocks	0.63	1.06	1.26	0.04	0.24	0.20	0.15	1.34
ADRs Per Year	0.65	3.15	0.46	10.23	0.38	0.50	1.88	0.46
	Philippines	Poland	Russia	South Africa	Thailand	Turkey	Mexico	
Disclosure Index	-0.58	0.36	-0.38	1.58	1.03	0.23	0.04	
Political Stability	-1.24	0.69	-1.02	-0.14	-0.70	-0.97	-0.58	
Rule of Law	-0.04	0.85	-0.34	0.47	0.26	0.30	0.36	
Stock Traded/GDP	12.38	8.06	30.19	42.34	44.63	34.23	8.67	
Domestic Credit/GDP	33.42	30.71	28.09	129.57	117.27	30.83	21.69	
GDP Growth	4.20	3.70	0.63	2.45	4.50	4.18	2.83	
Openness	0.39	0.30	0.42	0.17	0.34	0.30	0.63	
Cultural Distance	2.22	2.02	3.18	N/A	1.85	1.89	1.29	
Foreign Stocks	0.28	0.08	0.07	0.47	0.40	0.22	1.23	
ADRs Per Year	1.76	1.07	1.07	3.07	1.88	1.15	1.33	

Country Demands of ADRs

The previous literature provides some ambiguous empirical evidence between financial market development and internationalization of stock-market activities. Korczak and Korczak (2013) indicate the non-linear relationships between stock-market development and demand for ADRs. However, they didn't show clear thresholds between local stock-market development and international stock-market activities. This study extends previous studies by identifying two unknown cutoffs of stock-market development and investigating the relationship between stock-market development and DR's demand in developed and emerging countries separately.

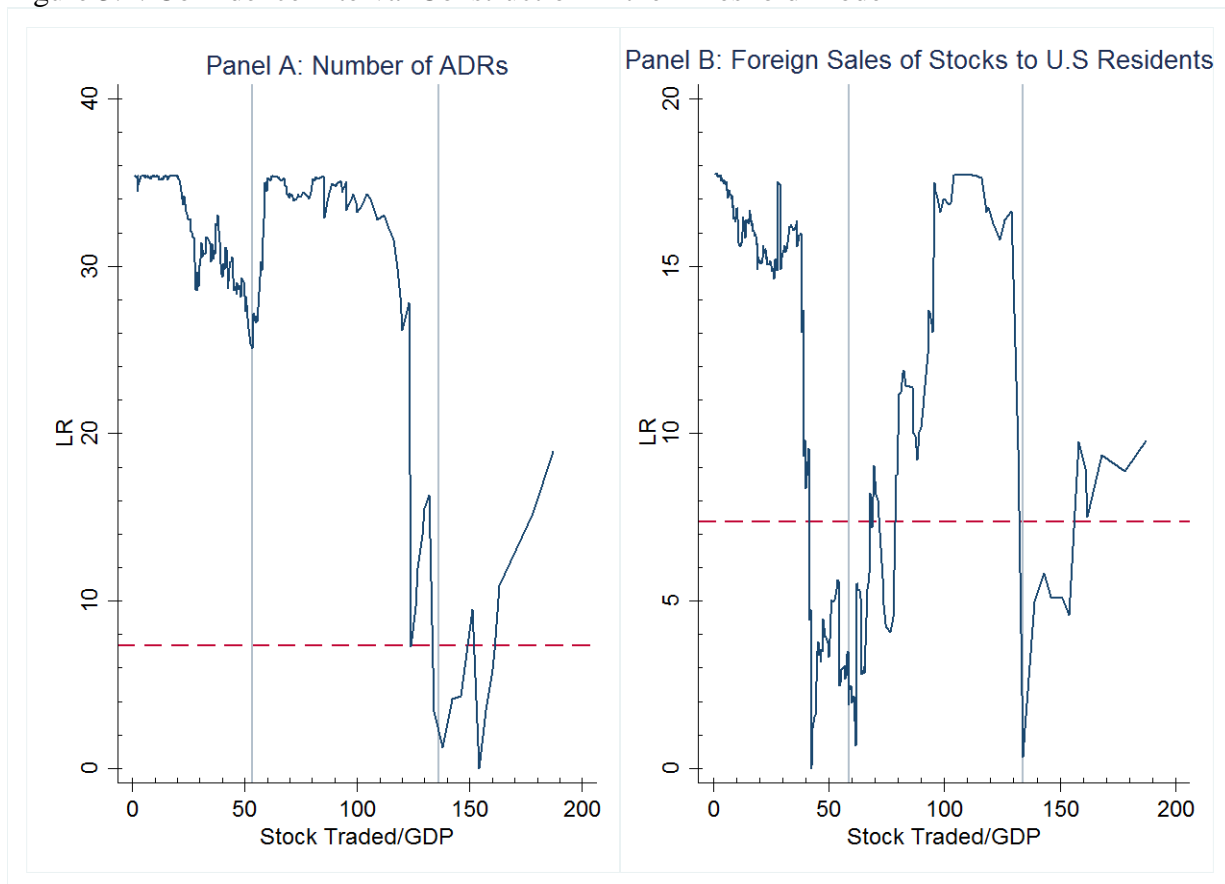
This study tests the threshold effects between stock traded/GDP and country's cross-listing activities. In Figure 3.2, it estimates two cut-off points between stock traded/GDP and the number of ADRs and between stock traded/GDP and foreign sales of stocks to U.S. residents. In Panel A, the first threshold of stock traded/GDP is 53.30, but it is not statistically significant. The second threshold of stock traded/GDP is 132.00. In Panel B, the first threshold of stock traded/GDP is 132.00 and the second threshold of stock traded/GDP is 58.80. Figure 3.2 shows the critical values $c(\alpha)$ using the dotted lines. The confidence interval for γ is likelihood ratio below $c(\alpha)$, and the threshold γ is the value when LR is zero. See the detailed estimation, F statistic (for $H_0: \beta_1 = \beta_2$), and LR and critical value (for $H_0: \gamma = \gamma_0$) in Table 3.2.

In the literature, some studies show a threshold effect of financial development on economic growth (Aghion, Howitt, & Mayer-Foulkes, 2005; Allegret & Azzabi, 2013). They show that the very low level of financial development might explain the inability of countries to converge to frontier growth rate. However, the higher the level of financial development, the lower its positive effect on steady-state per-capita GDP. Different from previous studies, this study explores country's demands for ADRs are respected to three thresholds, 1) low level of stock-

market liquidity (stock traded/GDP < 53.30 or 58.80), 2) sufficient liquidity of stock-markets (< 53.30 or 58.80 < stock traded/GDP <132.00), and 3) very strong liquidity of stock-market (stock traded/GDP >132.00).

Columns (1) and (2) in Table 3.3 show that stock traded/GDP is positively associated with demand for ADRs. The economic implications are that underlying firms highly demand U.S. capital when the home market becomes stronger, and U.S. investors highly demand shares of firms that come from sounder foreign stock-markets. The results from Columns (4) and (5) in Table 3.3 show that there are some non-linear relationships between cross-listing and stock traded/GDP. In Column (4), when the stock traded is less than 53.30, there is no significant relationship between stock traded/GDP and the total number of ADRs. When the stock traded/GDP is between 53.30 and 132.00, foreign countries have the highest demands of ADRs (0.313). After the liquidity of stock-market is over 132.00, local stock-markets have less positive effects on country's demands of ADRs (0.207).

Figure 3.2: Confidence Interval Construction in the Threshold Model



Notes: In the Panel A, the dependent variable is the number of ADRs for each country per year. In the Panel B, the dependent variable is foreign sales of stocks to U.S. residents per year. This section tests the threshold of stock traded/GDP. The LR is likelihood ratio.

Table 3.2: Threshold Estimate and Test for Threshold Effects

Panel A: Dependent Variable-Total Number of ADRs	
<u>Threshold Estimate</u>	
First Threshold Parameter	53.300
Second Threshold Parameter	132.000*
<u>Test for Threshold Effects</u>	
Test for Single Threshold	
F1	35.041***
P-value	0.000
(10%, 5%, 1% Critical Values)	[28.931, 23.030, 19.189]
Test for Double Thresholds	
F1	-2.915*
P-value	0.067
(10%, 5%, 1% Critical Values)	[5.838, -1.947, -5.905]
Panel B: Dependent Variable-Foreign Sales of Foreign Stocks to U.S. Residents	
<u>Threshold Estimate</u>	
First Threshold Parameter	132.000*
Second Threshold Parameter	58.800*
<u>Test for Threshold Effects</u>	
Test for Single Threshold	
F1	17.929
P-value	0.213
(10%, 5%, 1% Critical Values)	[25.210, 22.567, 20.756]
Test for Double Thresholds	
F1	44.978***
P-value	0.000
(10%, 5%, 1% Critical Values)	[2.049, -3.483, -6.827]

In the robustness test of Columns (3) and (5), the total number of ADRs are replaced by the growth of foreign sales of stocks to U.S. residents as the dependent variable. The total foreign sales of stocks to U.S. residents include ADRs and other cross-listings. The models in columns (3) and (5) are estimated by using fixed effects regressions. Column (5) shows that foreign sales of stocks to U.S. residents are not significantly associated with the local liquidity of stock-market when the stock traded to GDP is less than 58.80. However, when the local stock traded/GDP is between 58.80 and 132.00, foreign firms in most countries have most demands for cross-listings in the U.S. capital markets (0.250). After the local liquidity of stock-market is over 132.00, foreign countries have less demands for cross-listings in the U.S stock-markets (0.219). The economic implications are as follows: foreign countries have no demands for cross-listings when domestic stock-markets lack liquidity; however, country's demand for U.S. capital increase significantly when the local stock-markets become more liquid; when local markets have too much liquidity, foreign countries weaken their demands for cross-listings.

Moreover, disclosure index, political stability, and rule of law are positively associated with demands of ADRs. The positive coefficients of control variables in Column (2) - (5) indicate that countries with better legal protection and institutional quality tend to cross-list more in the U.S. capital markets. Column (1) shows that capital openness is negatively associated with demands of ADRs, suggesting countries with low capital openness tend to issue more ADRs. Because countries with low capital openness have very high costs of capital flows, the cross-listing is a better way to raise capital.

Table 3.3: Regression Results of Country's Demands for ADRs

The dependent variables are the number of ADRs in column (1, 2, and 4) and the growth of foreign sales of stocks to U.S. residents in column (3 and 5). The total foreign sales of stocks to U.S. residents include ADRs and other cross-listings. The threshold 1 is stock traded/GDP \leq 53 (or 58 for foreign sales of stocks to U.S. residents), threshold 2 is 53 (or 58) $<$ stock traded/GDP $<$ 132, and threshold 3 is stock traded/GDP \geq 132. Please see the detailed threshold estimation in Table 3.2. The regressions (1, 2 and 4) are estimated by Poisson model rather than OLS since the number of ADRs is count data. The regression (1) have 535 observations because the sample (stock traded/GDP and financial openness) is available from 1990 to 2015. However, regressions (2-5) lack the data of disclosure index and institutional quality from 1990-2004. Robust P-value in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)
	ADRs	ADRs	Growth of Total Foreign Stock	ADRs	Growth of Total Foreign Stock
Stock Traded/GDP	0.499*** (0.000)	0.274* (0.080)	0.204*** (0.000)		
Stock Traded/GDP* Threshold1				0.129 (0.690)	0.324 (0.168)
Stock Traded/GDP* Threshold2				0.313** (0.025)	0.250** (0.046)
Stock Traded/GDP* Threshold3				0.207*** (0.007)	0.219*** (0.001)
Capital Openness	-1.970** (0.011)				
Disclosure Index		0.226*** (0.000)	0.141*** (0.001)	0.181** (0.019)	0.141*** (0.001)
Political Stability			0.108* (0.069)	0.493** (0.014)	0.114 (0.349)
Rule of Law	0.894** (0.016)	1.312** (0.034)			
Observations	535	323	323	323	323
Number of Countries	35	33	33	33	33
Wald Chi ² /DF	616.3/18	384.0/12		642.7/14	
R-squared			0.381		0.382
Country & Year Effects	Yes	Yes	Yes	Yes	Yes
Model	Poisson & FE	Poisson & FE	OLS & FE	Poisson & FE	OLS & FE

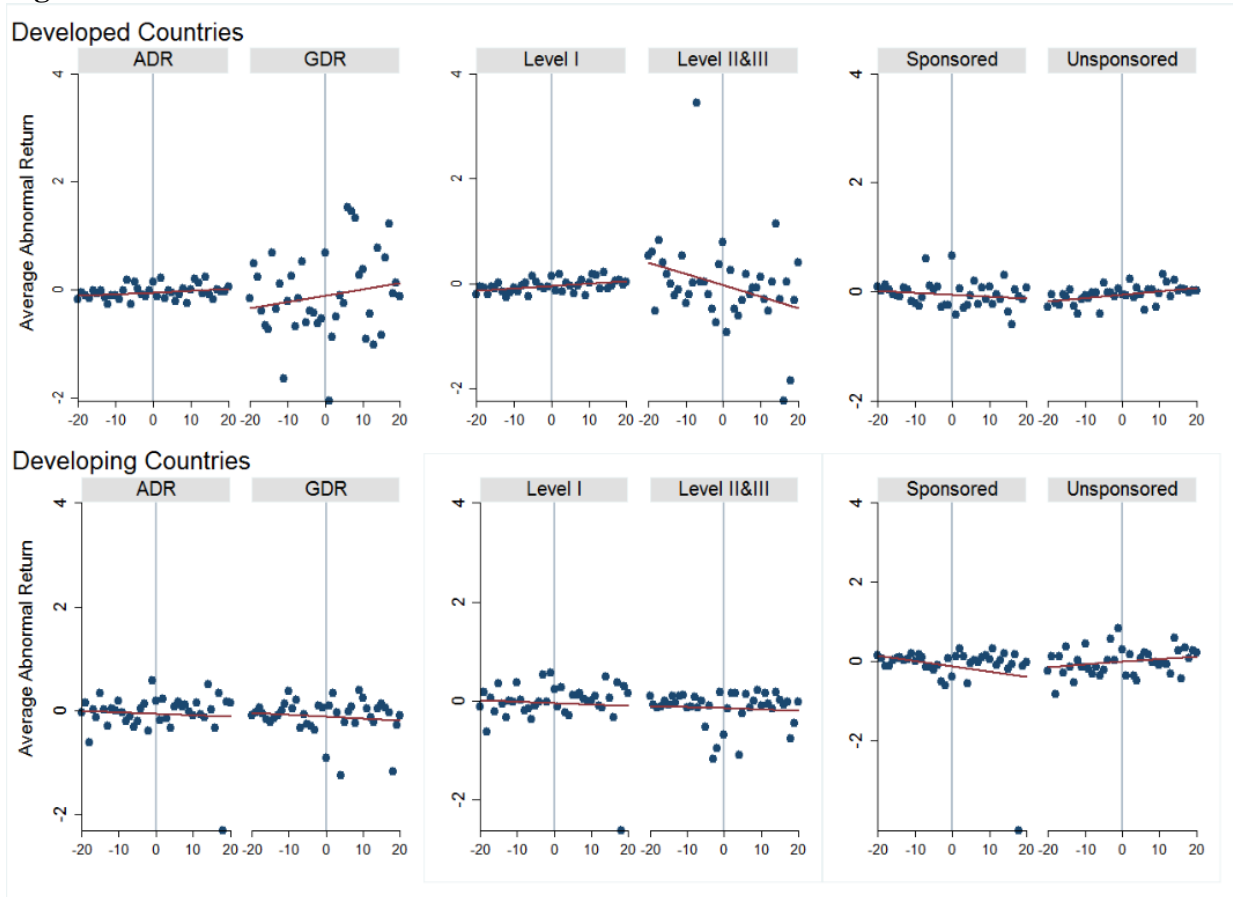
Abnormal Returns

Foreign firms are cross-listing shares on U.S. exchanges as ADRs yield abnormal returns around the event of cross-listing. According to the previous evidence and theories, abnormal returns result from the market segmentation, investor recognition, and bonding motivations (Foerster & Karolyi, 1999; Stulz, 1999; Doidge et al., 2004). Different from previous studies, this study supposes that abnormal returns will be impacted by foreign firms' choices on different types of depositary receipts. In Figure 3.3, in developed countries, abnormal returns of ADRs and GDRs are negative during 20 days before cross-listing and become positive during the 20 days following listing. However, the abnormal returns of GDRs are more volatile than ADRs. Compared with Level I ADRs, foreign firms earn significant abnormal returns during 20 days before Level II&III listing but incur a loss during 20 days following Level II&III listing. In the emerging countries, all types of DRs (i.e. ADRs, GDRs, Level I, and Level II&III) earn abnormal returns before listing and incur a loss after listing, but changes are very little. Finally, compared with sponsored and unsponsored DRs, sponsored DRs earn abnormal returns before cross-listing, but unsponsored DRs earn abnormal returns after cross-listing.

Table 3.4 compares cumulative average abnormal returns (CAAR) among different types of DRs, such as ADR, GDR, Level I ADR, Level II&III ADR, Sponsored DRs, and Unsponsored DRs. Also, this section compares the CAARs between developed and emerging countries in various event windows. Based on event windows (-1 to +1) and (-5 to +5), there are positive CAARs for foreign firms around the dates of ADR listing, but there are negative CAARs for foreign firms around the dates of GDR listing. In addition, foreign firms in emerging countries around the dates of level I ADR listing gain better abnormal returns than developed countries. However, listings of Level II&III DRs leads to negative abnormal returns for foreign firms in

emerging countries. Compared with listings of sponsored DRs, listings of unsponsored DRs are associated with significantly positive abnormal returns. After the announcement of DRs (+50 to +250), listings of ADR (or Level I ADRs) lead to much higher CAARs for foreign firms in emerging countries than in developed countries. Listings of GDR result in positive CAARs in developed countries, but they lead to negative CAARs in emerging countries. Finally, unsponsored DRs lead to significantly positive CAARs for foreign firms in both developed and emerging countries in the event window (+50 to +250).

Figure 3.3: Abnormal Returns



Source: All domestic firm's stock prices are collect from Compustat Global. This study collects 1,487 firms in developed countries and 668 firms in emerging countries.

Table 3.4: Cumulative Average Abnormal Return (CAAR)

	<u>Developed Countries</u>			<u>Emerging Countries</u>		
	Mean	Std. Err.	[95% Conf. Interval]	Mean	Std. Err.	[95% Conf. Interval]
Event Window: -1 to +1; Estimation Window: -250 to -20						
ADR	0.008	0.007	[-0.005 to 0.021]	0.580	0.008	[0.566 to 0.595]
GDR	-2.445	0.086	[-2.613 to -2.277]	-1.450	0.048	[-1.544 to -1.354]
Level I DRs	0.065	0.007	[-0.078 to -0.051]	0.652	0.008	[0.635 to 0.668]
Level II&III DRs	0.180	0.032	[0.117 to 0.243]	-0.833	0.028	[-0.887 to -0.778]
Sponsored DRs	-0.190	0.017	[-0.223 to -0.156]	-0.230	0.016	[-0.261 to -0.199]
Unsponsored DRs	0.012	0.006	[-0.000 to -0.023]	0.733	0.010	[0.712 to 0.752]
Event Window: -5 to +5; Estimation Window: -250 to -20						
ADR	0.094	0.009	[0.076 to 0.111]	0.207	0.019	[0.169 to 0.245]
GDR	-6.532	0.172	[-6.868 to -6.195]	-4.868	0.073	[-5.010 to -4.725]
Level I DRs	0.160	0.009	[0.141 to 0.178]	0.782	0.019	[0.745 to 0.818]
Level II&III DRs	0.180	0.032	[0.116 to 0.243]	-4.768	0.058	[-4.881 to -4.655]
Sponsored DRs	-1.330	0.022	[-1.373 to -1.286]	-1.502	0.033	[-1.567 to -1.436]
Unsponsored DRs	0.506	0.010	[0.486 to 0.524]	0.364	0.023	[0.318 to 0.408]
Event Window: +50 to +250; Estimation Window: -250 to -20						
ADR	1.675	0.050	[1.578 to 1.772]	13.656	0.200	[13.266 to 14.046]
GDR	14.566	0.486	[13.614 to 15.517]	-39.967	0.503	[-40.951 to -38.982]
Level I DRs	3.614	0.050	[3.516 to 3.712]	13.626	0.137	[13.356 to 13.894]
Level II&III DRs	-25.087	0.248	[-25.573 to -24.601]	-16.788	0.724	[-18.207 to -15.368]
Sponsored DRs	-16.098	0.108	[-16.309 to -15.887]	-13.016	0.432	[-13.863 to -12.169]
Unsponsored DRs	10.017	0.052	[9.916 to 10.118]	21.198	0.101	[20.999 to 21.395]

Firm's Choices on Different Types of Depositary Receipts

This study first supposes that firm and investor's DR choices should be impacted by domestic financial development. Columns (1) and (2) in Table 3.5 show the coefficients for financial development (i.e. Stock traded/GDP and domestic credit/GDP) are negative. The negative coefficients suggest that foreign firms in a country with worse financial development are more likely to issue GDRs rather than ADRs, but foreign firms in a country with better financial development are opposite. Columns (3) and (4) show negative coefficients for financial development, suggesting foreign firms in a country with worse financial development are more likely to issue level II&III rather than Level I ADRs. Columns (5) and (6) show that negative coefficients for financial development as well, indicating the foreign firms from worse financial development are issued less unsponsored DRs and issue more sponsored DRs.

Second, this section controls for disclosure index and political stability. Columns (1) and (2) show negative coefficients for disclosure index and political stability, suggesting that foreign firms from countries with worse disclosure requirements and political stability tend to issue more GDRs. Columns (3) and (4) shows negative coefficients for disclosure index, suggesting that foreign firms from countries with worse disclosure requirements are more likely to issue Level II&III ADRs, which is consistent with the bonding hypothesis. The negative coefficients for political stability indicate that firms from countries with worse political stability tend to issue Level II&III ADRs. Moreover, in some developed countries with high disclosure requirements, such as the U.K., Switzerland, and Japan, firms are likely to cross-list in the U.S. capital markets due to the scope of multinational firms and cross-listing premiums (Bianconi & Tan, 2010; Peng & Su, 2014). Hence, Level I ADRs with much better abnormal returns might be a better choice for these firms. However, in some emerging countries with low legal protection, such as Brazil,

China, Indonesia, Philippines, and Mexico, firms are more likely to choose Level II&III ADRs due to the bonding effect (Aggarwal et al., 2005). Thus, foreign firm and investor's choices on all types of DRs might be decided by many national factors such as financial development, legal protection, and political stability.

Third, proximity preference is another important influence on firms' choices of DRs. Column (1) and (2) show the negative coefficients for cultural distance, suggesting that investors or firms are more likely to issue GDRs because of the closer culture between home and host countries. Column (3) and (4) show the positive coefficients for cultural distance, indicating the more cultural distance between host and home countries, firms and investors would like to choose Level II&III DRs.

Finally, the model also controls for some firm characteristics, such as firm performance (ROA) and firm size (total number of employees). Firm characteristics are not significantly associated with choice 1 and choice 2 in column (1) to column (4). Columns (5) and (6) show that the negative coefficient for ROA, suggesting that sponsored DRs are associated with some lower performance of firms, but unsponsored DRs are related to the better performance of firms. Moreover, the positive coefficient for the total number of employees, indicating that sponsored DRs are associated with some larger size of firms.

Table 3.5: Logistic Regression Results of Firm Choices of DRs

This section explores what factors impact foreign firms' choices on 1) ADRs or GDRs, 2) Level I or Level II&III, and 3) sponsored or unsponsored DRs. Domestic credit is domestic credit provided by the financial sector to GDP. Stock Traded is local stock traded to GDP. Cultural distance is cultural distances between home and the U.S. The regressions also control for disclosure index and political stability. ROA is net income to total assets. Column (1) to (4) have fewer observations or numbers of firms because the four regression analysis excludes all unsponsored DRs. Robust P-value in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Choice 1 GDR: 1 & ADR: 0		Choice 2 Level II&III: 1 & Level I: 0		Choice 3 Sponsored: 1 & Unsponsored: 0	
Domestic Credit/GDP	-5.057** (0.011)		-0.439* (0.085)		-0.272* (0.063)	
Stock Traded/GDP		-5.442** (0.040)		-0.238** (0.036)		-0.252* (0.088)
Local Disclosure Index	-1.686*** (0.000)	-1.401*** (0.000)	-0.168* (0.092)	-0.191* (0.091)	-0.085** (0.029)	-0.132*** (0.001)
Political Stability	-5.624*** (0.000)	-8.317*** (0.000)	-0.932*** (0.001)	-1.141*** (0.000)	-0.040 (0.432)	-0.446 (0.360)
Cultural Distance	-5.266*** (0.001)	-3.585*** (0.008)	0.393** (0.030)	0.389* (0.063)	-0.502*** (0.000)	-0.559*** (0.000)
ROA	6.110 (0.483)	3.492 (0.679)	0.634 (0.128)	0.990 (0.159)	-4.152*** (0.000)	-3.397*** (0.000)
NO. of Employees	-0.033 (0.890)	0.306 (0.355)	-0.006 (0.984)	0.069 (0.139)	0.274*** (0.000)	0.283*** (0.000)
CAAR	0.025* (0.069)	0.038** (0.014)	-0.019** (0.023)	-0.020*** (0.008)	-0.001 (0.891)	0.004 (0.719)
Constant	22.265*** (0.000)	11.675*** (0.006)	-1.101 (0.233)	-1.428 (0.148)	2.872*** (0.000)	3.143*** (0.000)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
NO. of Firms	190	147	358	318	1,077	959
Pseudo R ²	0.597	0.631	0.187	0.205	0.242	0.242

Conclusions

This study first explores the non-linear linkages between domestic stock-market development and countries' demands of ADRs in three phases: 1) some countries have no explicit demands for cross-listing when domestic financial development is at a much lower level; 2) when local stock-markets become well-developed, most countries have the most demands for cross-listings; 3) however, after local stock-markets develop at very strong level, countries weaken their demands for cross-listings. These findings further improved the non-monotonic relationship proposed by Korczak and Korczak (2013): the demands for DRs first grows and then reduces as the local stock-market develops.

Second, some studies show that foreign firms earn abnormal returns before, around, and following the event of cross-listings. The market segmentation and investor recognition hypothesis can explain well the problems of abnormal returns (Foerster & Karolyi, 1999; Stulz, 1999). The market segmentation hypothesis shows that stock prices for foreign firms that cross-list from segmented markets will increase and their subsequent expected returns will decrease to compensate for the barriers dissipates. The investor recognition hypothesis shows that stock prices are expected to change due to changes in investor recognition. This study shows that foreign firms in emerging countries earn much more positive abnormal returns during the event of ADR listing and Level I DRs than firms in developed countries. Foreign firms in developed countries earn positive abnormal returns during the event of GDR listing, but firms in emerging countries do not. ADR/GDR arbitrage opportunity available in the market is generally attributed to time differences, market news, and sentiments. Thus, choices of ADR or GDRs might provide different signs or information for worldwide investors and issuers.

Third, this study shows that foreign firms from countries with worse financial developed countries are more likely to choose GDRs and level II&III ADRs. Karolyi (2004) finds that the high growth of ADR programs in emerging countries may be an outcome of the declining market conditions and not a cause of them. He argues that domestic financial development, political, legal, and other institutional forces are contributing to the deteriorating quality of the local markets and that these poorly functioning markets are creating incentives for firms to leave. Firms from countries with worse financial developed countries are more likely to choose GDRs and level II&III ADRs because they will enjoy the better economic environment and enhanced liquidity. However, firms from countries with better financial developed countries issue more Level 1 ADRs and unsponsored DRs might be more for diversifying investments. In addition, proximity performance and firm characteristics play a significant role in choices of DRs. The GDRs offer most of the same corporate rights to the holders of GDRs that investors of the underlying stocks enjoy. Some emerging countries, such as India and Russia, have significant proximity preferences on GDRs rather than ADRs. However, in some English-speaking countries, firms choose GDRs just due to easier trading.

CHAPTER IV

CONCLUDING REMARKS

The recent turbulence in the international financial market has dealt a blow to the world economy and aroused the concern of the entire international community. The capital account has been dominated by flows in the form of FDI, FPI, external commercial borrowing, and on-resident deposits. The dissertation mainly focuses on the FDI and FPI capital flows. The first essay introduces drivers of capital flows in FDI and FPI. The second essay explains what factors influence foreign countries and firms' demands of cross-listings.

The first essay contributes with new empirical evidence for academic studies on the capital flow management and international monetary policies. Due to the high volatility of international capital inflows and outflows, the topic of capital flow management is always attractive to researchers and policymakers. This study explores interdependencies among capital inflows, stock-market liquidity, and world GDP growth. I find that exogenous shocks of stock trading and world GDP growth have significant impacts capital inflows. Also, I find mutual Granger causality between domestic financial liquidity and FPI inflows. Moreover, capital inflows are positively associated with the liquidity of stock-market, suggesting the well-developed local stock-market will attract more international capital inflows.

Moreover, push factors also play important roles to drive capital flows. For example, the growth of global economy and oil price significantly impact the size and composition of capital

flows across G20 countries. Furthermore, the macroeconomic policies of reserve currency and capital restrictions have significant impacts on capital flows in the emerging countries. The macro-prudential policy of the individual country will exacerbate imbalance of capital flows across countries. However, under the G20 international framework, an efficient capital flow management will facilitate stability of capital flows between advanced and emerging nations.

The second essay explores country's and firm's demands of DRs. The financial liberalization allows free flow of capital and removes barriers to international investing. From the literature, foreign firms seek to cross-listing because they will benefit from overcoming market segmentation, increased market liquidity, improved investor recognition, and better investor protection. In the current world, all developed countries have already gone through the process of liberalization, and emerging countries still regulate domestic financial markets. Different from these motivations of cross-listing, this study mainly shows that financial development significantly affects countries demands of DRs and firm's choices on different DRs.

The second essay firstly examines a threshold effect of stock-market development on country's demands for ADRs. When domestic financial development is at a much lower level, some countries have no explicit demands for cross-listing. When local stock-markets become well-developed, most countries have great demands for cross-listings. However, after local stock-market develops at the very strong level, the influence of financial development on demands of cross-listings is less. These findings further improved the non-monotonic relationship proposed by Korczak and Korczak (2013): the demands for DRs first grows and then reduces as the local stock-market develops.

Moreover, the second essay examines whether firm's choices on various types of DRs are associated with some macroeconomic factors, such as domestic credit to GDP, stock traded to

GDP, disclosure index, and political stability. This essay shows that foreign firms in a country with worse financial development investor protection and political stability are more likely to issue GDRs and Level II & III DRs. Conversely, foreign firms are more likely to issue Level I DRs and unsponsored DRs in a country with better financial development, investor protection, and political stability. Finally, this essay further shows that firm's choices for different types of DRs are also related to proximity preferences. For example, since GDRs offer most of the same corporate rights to the holders of GDRs that investors of the underlying stocks enjoy, some emerging countries, such as India and Russia, have significant proximity preferences on GDRs rather than ADRs. However, in some English-speaking countries, firms choose GDRs just due to easier trading.

REFERENCES

- Agénor, P. R. (1998). The surge in capital flows: analysis of 'pull' and 'push' factors. *International Journal of Finance & Economics*, 3(1), 39-57.
- Aggarwal, R., Klapper, L., & Wysocki, P. D. (2005). Portfolio preferences of foreign institutional investors. *Journal of Banking & Finance*, 29(12), 2919-2946.
- Aghion, P., Howitt, P., & Mayer-Foulkes, D. (2005). The effect of financial development on convergence: Theory and evidence. *The Quarterly Journal of Economics*, 120(1), 173-222.
- Ahmed, S., & Zlate, A. (2014). Capital flows to emerging market economies: A brave new world? *Journal of International Money and Finance*, 48(Part B), 221-248.
- Aizenman, J., Jinjara, Y., & Park, D. (2013). Capital flows and economic growth in the era of financial integration and crisis, 1990–2010. *Open Economies Review*, 24(3), 371-396.
- Albuquerque, R. (2003). The composition of international capital flows: risk sharing through foreign direct investment. *Journal of International Economics*, 61(2), 353-383.
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of International Economics*, 64(1), 89-112.
- Alfaro, L., Kalemli-Ozcan, S., & Volosovych, V. (2008). Why Doesn't Capital Flow from Rich to Poor Countries? An Empirical Investigation. *The Review of Economics and Statistics*, 90(2), 347-368.
- Alhaj-Yaseen, Y. S., Lam, E., & Barkoulas, J. T. (2014). Price discovery for cross-listed firms with foreign IPOs. *International Review of Financial Analysis*, 31, 80-87.
- Allegret, J.-P., & Azzabi, S. (2013). Financial development, threshold effects and convergence in developing and emerging countries. *Economics Bulletin*, 33(3), 1899-1921.
- Álvarez, I., & Marín, R. (2010). Entry modes and national systems of innovation. *Journal of International Management*, 16(4), 340-353.

- Anaya, P., Hachula, M., & Offermanns, C. J. (2017). Spillovers of U.S. unconventional monetary policy to emerging markets: The role of capital flows. *Journal of International Money and Finance*, 73(Part B), 275-295.
- Ansotegui, C., Bassiouny, A., & Tooma, E. (2013). The proof is in the pudding: Arbitrage is possible in limited emerging markets. *Journal of International Financial Markets, Institutions and Money*, 23, 342-357.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277-297.
- Ashraf, A., Herzer, D., & Nunnenkamp, P. (2016). The Effects of Greenfield FDI and Cross-border M&As on Total Factor Productivity. *The World Economy*, 39(11), 1728-1755.
- Asiedu, E. (2006). Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. *The World Economy*, 29(1), 63-77.
- Aviat, A., & Coeurdacier, N. (2007). The geography of trade in goods and asset holdings. *Journal of International Economics*, 71(1), 22-51.
- Bae, S. C., Kwon, T. H., & Li, M. (2008). Foreign exchange rate exposure and risk premium in international investments: Evidence from American depositary receipts. *Journal of Multinational Financial Management*, 18(2), 165-179.
- Baek, I.-M. (2006). Portfolio investment flows to Asia and Latin America: Pull, push or market sentiment? *Journal of Asian Economics*, 17(2), 363-373.
- Baker, H. K., Nofsinger, J. R., & Weaver, D. G. (2002). International cross-listing and visibility. *Journal of Financial and Quantitative Analysis*, 37(03), 495-521.
- Barone, B., & Bendini, R. (2015). Protectionism in the G20. *Directorate-General for External Policies of the Union Policy Department. European Union, Belgium*.
- Beckmann, K. S., Ngo, T., & Wang, D. (2015). The informational content of ADR mispricing. *Journal of Multinational Financial Management*.
- Bekaert, G., & Harvey, C. R. (1998). *Capital flows and the behavior of emerging market equity returns*. National bureau of economic research.
- Bekaert, G., & Harvey, C. R. (2002). Research in emerging markets finance: looking to the future. *Emerging Markets Review*, 3(4), 429-448.
- Bekaert, G., & Harvey, C. R. (2003). Emerging markets finance. *Journal of Empirical Finance*, 10(1-2), 3-55.

- Bekaert, G., Harvey, C. R., & Lumsdaine, R. L. (2002). Dating the integration of world equity markets. *Journal of Financial Economics*, 65(2), 203-247.
- Benhima, K. (2013). A reappraisal of the allocation puzzle through the portfolio approach. *Journal of International Economics*, 89(2), 331-346.
- Berkman, H., & Nguyen, N. H. (2010). Domestic liquidity and cross-listing in the United States. *Journal of Banking & Finance*, 34(6), 1139-1151.
- Bessler, W., Kaen, F. R., Kurmann, P., & Zimmermann, J. (2012). The listing and delisting of German firms on NYSE and NASDAQ: Were there any benefits? *Journal of International Financial Markets, Institutions and Money*, 22(4), 1024-1053.
- Bhandari, B. (2007). Effect of Inward Foreign Direct Investment on Income Inequality in Transition Countries. *Journal of Economic Integration*, 22(4), 888-928.
- Bianconi, M., & Tan, L. (2010). Cross-listing premium in the US and the UK destination. *International Review of Economics & Finance*, 19(2), 244-259.
- Binici, M., Hutchison, M., & Schindler, M. (2010). Controlling capital? Legal restrictions and the asset composition of international financial flows. *Journal of International Money and Finance*, 29(4), 666-684.
- Blouin, J., Hail, L., & Yetman, M. H. (2009). Capital gains taxes, pricing spreads, and arbitrage: Evidence from cross-listed firms in the US. *The Accounting Review*, 84(5), 1321-1361.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, 87(1), 115-143.
- Bond, S. R., Hoeffler, A., & Temple, J. R. (2001). GMM estimation of empirical growth models. Institute for Fiscal Studies. London.
- Boubakri, N., Cosset, J.-C., & Samet, A. (2010). The choice of ADRs. *Journal of Banking & Finance*, 34(9), 2077-2095.
- Brennan, M. J., & Cao, H. H. (1997). International portfolio investment flows. *The Journal of Finance*, 52(5), 1851-1880.
- Bris, A., Cantale, S., Hrnjić, E., & Nishiotis, G. P. (2012). The value of information in cross-listing. *Journal of Corporate Finance*, 18(2), 207-220.
- Brockman, P., & Hao, Q. (2011). Short Selling and Price Discovery: Evidence from American Depository Receipts. *Journal of Financial Research*, 34(4), 569-588.
- Broner, F., Didier, T., Erce, A., & Schmukler, S. L. (2013). Gross capital flows: Dynamics and crises. *Journal of Monetary Economics*, 60(1), 113-133.

- Bruno, V., & Shin, H. S. (2013). *Capital flows, cross-border banking and global liquidity*. National Bureau of Economic Research.
- Bruno, V., & Shin, H. S. (2014). Assessing macroprudential policies: case of South Korea. *The Scandinavian Journal of Economics*, 116(1), 128-157.
- Cai, C. X., McGuinness, P. B., & Zhang, Q. (2011). The pricing dynamics of cross-listed securities: The case of Chinese A- and H-shares. *Journal of Banking & Finance*, 35(8), 2123-2136.
- Calderon, C., & Kubota, M. (2012). *Gross inflows gone wild: gross capital inflows, credit booms and crises*. Policy Research Working Papers.
- Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1993). Capital Inflows and Real Exchange Rate Appreciation in Latin America: The Role of External Factors. *Staff Papers (International Monetary Fund)*, 40(1), 108-151.
- Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1996). Inflows of Capital to Developing Countries in the 1990s. *The Journal of Economic Perspectives*, 10(2), 123-139.
- Caporale, G. M., & Girardi, A. (2016). Business cycles, international trade and capital flows: evidence from Latin America. *Empirical Economics*, 50(2), 231-252.
- Cardoso, E., & Goldfajn, I. (1998). Capital flows to Brazil: the endogeneity of capital controls. *Staff Papers*, 45(1), 161-202.
- Carkovic, M. V., & Levine, R. (2002). *Does foreign direct investment accelerate economic growth?* In mimeo, University of Minnesota.
- Carstensen, K., & Toubal, F. (2004). Foreign direct investment in Central and Eastern European countries: a dynamic panel analysis. *Journal of Comparative Economics*, 32(1), 3-22.
- Chaplinsky, S., & Ramchand, L. (2012). What drives delistings of foreign firms from U.S. Exchanges? *Journal of International Financial Markets, Institutions and Money*, 22(5), 1126-1148.
- Chen, K. C., Chen, Z., & Wei, K. J. (2009). Legal protection of investors, corporate governance, and the cost of equity capital. *Journal of Corporate Finance*, 15(3), 273-289.
- Choong, C.-K., Baharumshah, A. Z., Yusop, Z., & Habibullah, M. S. (2010). Private capital flows, stock market and economic growth in developed and developing countries: A comparative analysis. *Japan and the World Economy*, 22(2), 107-117.
- Chuhan, P., Claessens, S., & Mamingi, N. (1998). Equity and bond flows to Latin America and Asia: the role of global and country factors. *Journal of Development Economics*, 55(2), 439-463.

- Claessens, S. (2015). An Overview of Macroprudential Policy Tools. *Annual Review of Financial Economics*, 7(1), 397-422.
- Claessens, S., Klingebiel, D., & Schmukler, S. (2001). *FDI and Stock Market Development: Complements or Substitutes?* World Bank Working Paper.
- Claessens, S., Klingebiel, D., & Schmukler, S. L. (2006). Stock market development and internationalization: Do economic fundamentals spur both similarly? *Journal of Empirical Finance*, 13(3), 316-350.
- Cosset, J.-C., Martineau, C., & Samet, A. (2014). Do political institutions affect the choice of the U.S. cross-listing venue? *Journal of Multinational Financial Management*, 27, 22-48.
- Daugherty, M., & Georgieva, D. (2011). Foreign cultures, Sarbanes–Oxley Act and cross-delisting. *Journal of Multinational Financial Management*, 21(4), 208-223.
- De Vita, G., & Kyaw, K. S. (2008). Determinants of capital flows to developing countries: a structural VAR analysis. *Journal of Economic Studies*, 35(4), 304-322.
- Di Giovanni, J. (2005). What drives capital flows? The case of cross-border M&A activity and financial deepening. *Journal of International Economics*, 65(1), 127-149.
- Dodd, O., Frijns, B., & Gilbert, A. (2015). On the Role of Cultural Distance in the Decision to Cross-List. *European Financial Management*, 21(4), 706-741.
- Doidge, C., Karolyi, G. A., Lins, K. V., Miller, D. P., & Stulz, R. M. (2009). Private Benefits of Control, Ownership, and the Cross-listing Decision. *The Journal of Finance*, 64(1), 425-466.
- Doidge, C., Karolyi, G. A., & Stulz, R. M. (2004). Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics*, 71(2), 205-238.
- Doidge, C., Karolyi, G. A., & Stulz, R. M. (2009). Has New York become less competitive than London in global markets? Evaluating foreign listing choices over time. *Journal of Financial Economics*, 91(3), 253-277.
- Domowitz, I., Glen, J., & Madhavan, A. (1998). International Cross-Listing and Order Flow Migration: Evidence from an Emerging Market. *The Journal of Finance*, 53(6), 2001-2027.
- Doukas, J. A., & Wang, L. (2014). Does the bonding effect matter in a more integrated capital market world? *Journal of International Money and Finance*, 47, 162-184.
- Dunning, J. (1981). Explaining the international direct investment position of countries: Towards a dynamic or developmental approach. *Review of World Economics (Weltwirtschaftliches Archiv)*, 117(1), 30-64.

- Dunning, J. H. (2006). Towards a new paradigm of development: implications for the determinants of international business. *Transnational corporations*, 15(1), 173-227.
- Durham, B. J. (2002). The effects of stock market development on growth and private investment in lower-income countries. *Emerging Markets Review*, 3(3), 211-232.
- Dutta, N., & Roy, S. (2011). Foreign direct investment, financial development and political risks. *The Journal of Developing Areas*, 303-327.
- Edison, H. J., & Warnock, F. E. (2008). Cross-border listings, capital controls, and equity flows to emerging markets. *Journal of International Money and Finance*, 27(6), 1013-1027.
- Eichler, S. (2012). Limited investor attention and the mispricing of American Depositary Receipts. *Economics Letters*, 115(3), 490-492.
- El-Wassal, K. A. (2005). Understanding the growth in emerging stock markets. *Journal of Emerging Market Finance*, 4(3), 227-261.
- Errunza, V. R., & Miller, D. P. (2000). Market segmentation and the cost of the capital in international equity markets. *Journal of Financial and Quantitative Analysis*, 35(04), 577-600.
- Fang, C.-R., & You, S.-Y. (2014). The impact of oil price shocks on the large emerging countries' stock prices: Evidence from China, India and Russia. *International Review of Economics & Finance*, 29, 330-338.
- Fernandes, N., & Ferreira, M. A. (2008). Does international cross-listing improve the information environment. *Journal of Financial Economics*, 88(2), 216-244.
- Fernández, A., Klein, M. W., Rebucci, A., Schindler, M., & Uribe, M. (2016). Capital control measures: A new dataset. *IMF Economic Review*, 64(3), 548-574.
- Foerster, S. R., & Karolyi, G. A. (1999). The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States. *The Journal of Finance*, 54(3), 981-1013.
- Forbes, K. J., & Warnock, F. E. (2012). Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of International Economics*, 88(2), 235-251.
- Foucault, T., & Gehrig, T. (2008). Stock price informativeness, cross-listings, and investment decisions. *Journal of Financial Economics*, 88(1), 146-168.
- Fratzscher, M. (2012). Capital flows, push versus pull factors and the global financial crisis. *Journal of International Economics*, 88(2), 341-356.

- Frijns, B., Indriawan, I., & Tourani-Rad, A. (2015). Macroeconomic news announcements and price discovery: Evidence from Canadian–U.S. cross-listed firms. *Journal of Empirical Finance*, 32, 35-48.
- Froot, K. A., O’Connell, P. G., & Seasholes, M. S. (2001). The portfolio flows of international investors. *Journal of Financial Economics*, 59(2), 151-193.
- Froot, K. A., & Ramadorai, T. (2008). Institutional portfolio flows and international investments. *Review of Financial Studies*, 21(2), 937-971.
- Gagnon, L., & Witmer, J. (2014). Distribution of Ownership, Short Sale Constraints, and Market Efficiency: Evidence from Cross-Listed Stocks. *Financial Management*, 43(3), 631-670.
- Gallagher, K. P. (2015). Contesting the Governance of Capital Flows at the IMF. *Governance*, 28(2), 185-198.
- Gallagher, K. P., & Tian, Y. (2017). Regulating capital flows in emerging markets: The IMF and the global financial crisis. *Review of Development Finance*.
- Gemmill, G., & Thomas, D. C. (2002). Noise Trading, Costly Arbitrage, and Asset Prices: Evidence from Closed-end Funds. *The Journal of Finance*, 57(6), 2571-2594.
- Gilmore, C. G., & McManus, G. M. (2002). International portfolio diversification: US and Central European equity markets. *Emerging Markets Review*, 3(1), 69-83.
- Glick, R., & Hutchison, M. (2009). Navigating the trilemma: Capital flows and monetary policy in China. *Journal of Asian Economics*, 20(3), 205-224.
- Gourinchas, P.-O., & Jeanne, O. (2013). Capital Flows to Developing Countries: The Allocation Puzzle. *The Review of Economic Studies*, 80(4 (285)), 1484-1515.
- Griffin, J. M., Nardari, F., & Stulz, R. M. (2004). Are daily cross-border equity flows pushed or pulled? *Review of Economics and Statistics*, 86(3), 641-657.
- Grossmann, A., & Beach, S. L. (2010). Expanding a U.S. portfolio internationally: ADRs, their underlying assets, and ETFs. *Financial Services Review*, 19, 163+.
- Grossmann, A., Ozuna, T., & Simpson, M. W. (2007). ADR mispricing: Do costly arbitrage and consumer sentiment explain the price deviation? *Journal of International Financial Markets, Institutions and Money*, 17(4), 361-371.
- Hales, A. D., & Mollick, A. V. (2014). The impact of ADR activity on stock market liquidity: Evidence from Latin America. *The Quarterly Review of Economics and Finance*, 54(3), 417-427.

- Halling, M., Pagano, M., Randl, O., & Zechner, J. (2008). Where is the market? Evidence from cross-listings in the United States. *Review of Financial Studies*, 21(2), 725-761.
- Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of econometrics*, 93(2), 345-368.
- Harrison, A. E., & McMillan, M. S. (2003). Does direct foreign investment affect domestic credit constraints? *Journal of International Economics*, 61(1), 73-100.
- He, H., & Yang, J. (2012). Day and night returns of Chinese ADRs. *Journal of Banking & Finance*, 36(10), 2795-2803.
- Helpman, E., Melitz, M. J., & Yeaple, S. R. (2004). Export Versus FDI with Heterogeneous Firms. *American Economic Review*, 94(1), 300-316.
- Henry, P. B. (2000). Do stock market liberalizations cause investment booms? *Journal of Financial Economics*, 58(1), 301-334.
- Hermes, N., & Lensink, R. (2003). Foreign direct investment, financial development and economic growth. *The Journal of Development Studies*, 40(1), 142-163.
- Herrmann, S., & Mihaljek, D. (2013). The determinants of cross-border bank flows to emerging markets. *Economics of Transition*, 21(3), 479-508.
- Hope, O.-K., Kang, T., Thomas, W. B., & Vasvari, F. (2008). Pricing and Mispricing Effects of SFAS 131. *Journal of Business Finance & Accounting*, 35(3-4), 281-306.
- Hsu, J., & Wang, H.-Y. (2008). Why do price spreads between domestic shares and their ADRs vary over time? *Pacific Economic Review*, 13(4), 473-491.
- Hung, M., Wong, T. J., & Zhang, T. (2012). Political considerations in the decision of Chinese SOEs to list in Hong Kong. *Journal of Accounting and Economics*, 53(1-2), 435-449.
- Iliev, P., Miller, D. P., & Roth, L. (2014). Uninvited U.S. Investors? Economic Consequences of Involuntary Cross-Listings. *Journal of Accounting Research*, 52(2), 473-519.
- IMF. (2016). *Capital flows-review of experience with the institutional view*. International Monetary Fund.
- Jansen, W. J., & Stokman, A. C. (2004). *Foreign direct investment and international business cycle comovement*. ECB Working Paper No. 401.
- Jaumotte, F., Lall, S., & Papageorgiou, C. (2013). Rising income inequality: technology, or trade and financial globalization? *IMF Economic Review*, 61(2), 271-309.

- Ju, J., & Wei, S.-J. (2010). Domestic Institutions and the Bypass Effect of Financial Globalization. *American Economic Journal: Economic Policy*, 2(4), 173-204.
- Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: a guide for macroeconomists. *Economics Letters*, 65(1), 9-15.
- Karolyi, G. A. (1998). Why do companies list shares abroad?: A survey of the evidence and its managerial implications. *Financial Markets, Institutions & Instruments*, 7(1), 1-60.
- Karolyi, G. A. (2004). The Role of American Depositary Receipts in the Development of Emerging Equity Markets. *The Review of Economics and Statistics*, 86(3), 670-690.
- Kim, S.-J., & Wu, E. (2008). Sovereign credit ratings, capital flows and financial sector development in emerging markets. *Emerging markets review*, 9(1), 17-39.
- Kim, S., & Kim, S. H. (2013). International Capital Flows, Boom-bust Cycles, and Business Cycle Synchronization in the Asia Pacific Region. *Contemporary economic policy*, 31(1), 191-211.
- Kim, Y.-H. (2009). Cross-border M&A vs. greenfield FDI: Economic integration and its welfare impact. *Journal of Policy Modeling*, 31(1), 87-101.
- Kim, Y. (2000). Causes of capital flows in developing countries. *Journal of International Money and Finance*, 19(2), 235-253.
- Kleimeier, S., Sander, H., & Heuchemer, S. (2013). Financial crises and cross-border banking: New evidence. *Journal of International Money and Finance*, 32, 884-915.
- Klitgaard, T., & Higgins, M. (2004). *Reserve accumulation: Implications for global capital flows and financial markets*. Current Issues in Economics and Finance, no. 10. New York: Federal Reserve Bank of New York.
- Koepke, R. (2015). *What Drives Capital Flows to Emerging Markets? A Survey of the Empirical Literature*. University Library of Munich, Germany.
- Korczak, A., & Korczak, P. (2013). The development of emerging stock markets and the demand for cross-listing. *Journal of Empirical Finance*, 24, 63-77.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics*, 58(1), 3-27.
- Lamont, O. A., & Thaler, R. H. (2003). Anomalies: The Law of One Price in Financial Markets. *The Journal of Economic Perspectives*, 17(4), 191-202.
- Lane, P. R., & McQuade, P. (2014). Domestic credit growth and international capital flows. *The Scandinavian Journal of Economics*, 116(1), 218-252.

- Lang, M. H., Lins, K. V., & Miller, D. P. (2003). ADRs, Analysts, and Accuracy: Does Cross Listing in the United States Improve a Firm's Information Environment and Increase Market Value? *Journal of Accounting Research*, 41(2), 317-345.
- Lee, J.-Y. (1997). *Sterilizing capital inflows* (Vol. 7): International Monetary Fund.
- Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2), 688-726.
- Levine, R., & Schmukler, S. L. (2007). Migration, spillovers, and trade diversion: The impact of internationalization on domestic stock market activity. *Journal of Banking & Finance*, 31(6), 1595-1612.
- Licht, A. N. (2003). Cross-Listing and Corporate Governance: Bonding or Avoiding? *Chicago Journal of International Law*, 4(1), 11.
- Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior: Evidence from panel VAR. *The Quarterly Review of Economics and Finance*, 46(2), 190-210.
- Lucas, R. E. (1990). Why Doesn't Capital Flow from Rich to Poor Countries? *The American Economic Review*, 80(2), 92-96.
- Marosi, A., & Massoud, N. (2008). "You Can Enter but You Cannot Leave...": US Securities Markets and Foreign Firms. *The Journal of Finance*, 63(5), 2477-2506.
- Milesi-Ferretti, G.-M., & Tille, C. (2011). The great retrenchment: international capital flows during the global financial crisis. *Economic Policy*, 26(66), 289-346.
- Miller, D. P. (1999). The market reaction to international cross-listings: evidence from Depository Receipts¹. *Journal of Financial Economics*, 51(1), 103-123.
- Mody, A., & Murshid, A. P. (2005). Growing up with capital flows. *Journal of International Economics*, 65(1), 249-266.
- Montiel, P., & Reinhart, C. M. (1999). Do capital controls and macroeconomic policies influence the volume and composition of capital flows? Evidence from the 1990s. *Journal of International Money and Finance*, 18(4), 619-635.
- Okada, K. (2013). The interaction effects of financial openness and institutions on international capital flows. *Journal of Macroeconomics*, 35, 131-143.
- Ostry, J. D., & Ghosh, A. R. (2016). On the obstacles to international policy coordination. *Journal of International Money and Finance*, 67(Supplement C), 25-40.

- Ostry, J. D., Ghosh, A. R., Chamon, M., & Qureshi, M. S. (2012). Tools for managing financial-stability risks from capital inflows. *Journal of International Economics*, 88(2), 407-421.
- Pagano, M., Randl, O., Röell, A. A., & Zechner, J. (2001). What makes stock exchanges succeed? Evidence from cross-listing decisions. *European Economic Review*, 45(4–6), 770-782.
- Pagano, M., Röell, A. A., & Zechner, J. (2002). The Geography of Equity Listing: Why Do Companies List Abroad? *The Journal of Finance*, 57(6), 2651-2694.
- Pan, F., & Brooker, D. (2014). Going global? Examining the geography of Chinese firms' overseas listings on international stock exchanges. *Geoforum*, 52, 1-11.
- Papaioannou, E. (2009). What drives international financial flows? Politics, institutions and other determinants. *Journal of Development Economics*, 88(2), 269-281.
- Pasricha, G. K. (2012). Recent trends in measures to manage capital flows in emerging economies. *The North American Journal of Economics and Finance*, 23(3), 286-309.
- Patnaik, P. (2007). Financial Crises, Reserve Accumulation and Capital Flows. *Economic and Political Weekly*, 45-51.
- Peng, M. W., & Su, W. (2014). Cross-listing and the scope of the firm. *Journal of World Business*, 49(1), 42-50.
- Piotroski, J. D., & Srinivasan, S. (2008). Regulation and Bonding: The Sarbanes-Oxley Act and the Flow of International Listings. *Journal of Accounting Research*, 46(2), 383-425.
- Pontiff, J. (1996). Costly Arbitrage: Evidence from Closed-End Funds. *The Quarterly Journal of Economics*, 111(4), 1135-1151.
- Portes, R., & Rey, H. (2005). The determinants of cross-border equity flows. *Journal of International Economics*, 65(2), 269-296.
- Reinhardt, D., Ricci, L. A., & Tressel, T. (2013). International capital flows and development: Financial openness matters. *Journal of International Economics*, 91(2), 235-251.
- Reinhart, C. M., Reinhart, V., & Trebesch, C. (2016). Global Cycles: Capital Flows, Commodities, and Sovereign Defaults, 1815–2015. *The American Economic Review*, 106(5), 574-580.
- Reinhart, C. M., & Reinhart, V. R. (1999). On the use of reserve requirements in dealing with capital flow problems. *International Journal of Finance & Economics*, 4(1), 27.
- Reisen, H., & Soto, M. (2001). Which Types of Capital Inflows Foster Developing-Country Growth? *International Finance*, 4(1), 1-14.

- Roosenboom, P., & van Dijk, M. A. (2009). The market reaction to cross-listings: Does the destination market matter? *Journal of Banking & Finance*, 33(10), 1898-1908.
- Samarina, A., & Bezemer, D. (2016). Do capital flows change domestic credit allocation? *Journal of International Money and Finance*, 62, 98-121.
- Sarkissian, S., & Schill, M. J. (2004). The Overseas Listing Decision: New Evidence of Proximity Preference. *The Review of Financial Studies*, 17(3), 769-809.
- Sauvant, K. P. (2016). China, the G20 and the international investment regime. *China & World Economy*, 24(4), 73-92.
- Silva, A. C., & Chávez, G. A. (2008). Cross-listing and liquidity in emerging market stocks. *Journal of Banking & Finance*, 32(3), 420-433.
- Stulz, R. M. (1999). Globalization, corporate finance, and the cost of capital. *Journal of applied corporate finance*, 12(3), 8-25.
- Vestergaard, J., & Wade, R. H. (2012). Establishing a new Global Economic Council: governance reform at the G20, the IMF and the World Bank. *Global Policy*, 3(3), 257-269.
- Wang, J., & Zhou, H. (2015). Competition of trading volume among markets: Evidence from stocks with multiple cross-listing destinations. *Journal of Multinational Financial Management*, 31, 23-62.
- Warnock, F. E., & Warnock, V. C. (2009). International capital flows and U.S. interest rates. *Journal of International Money and Finance*, 28(6), 903-919.
- What is driving Brazil's economic downturn? (2016). *ECB Economic Bulletin*(1), 16-18.
- You, L., Parhizgari, A. M., & Srivastava, S. (2012). Cross-listing and subsequent delisting in foreign markets. *Journal of Empirical Finance*, 19(2), 200-216.
- Zhang, L., & Zoli, E. (2016). Leaning against the wind: Macroprudential policy in Asia. *Journal of Asian Economics*, 42(Supplement C), 33-52

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