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# The Landscape of FDI Flows

Nicholas Rohl

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**THE LANDSCAPE OF FDI FLOWS**

by

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**B.S, ECONOMICS, UNIVERSITY OF WISCONSIN LA CROSSE, 2010**

THESIS

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## **DEDICATION**

This is for my family and friends, without your love and support I would have quit writing a long time ago.

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# **THE LANDSCAPE OF FDI FLOWS**

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## **ABSTRACT**

Over the last forty years, the world has experienced a rapid rise in the level and significant shift in the composition of recipients of foreign direct investment (FDI) flows. Researching FDI is critical because of the increasingly important role it has in the global economy and the many potential benefits it provides investors and host countries. This paper will examine the past, current, and future state of FDI flows.

An aggregate inflows dataset as well as a specific pair flows dataset will be analyzed to gain a better understanding of the drivers of FDI. The aggregate flows dataset contains data on FDI inflows and the potential determinants of market potential, stability, information, infrastructure, natural resources, and international trade for 229 countries from 1970-2010. The specific pair flows dataset contains data on the total level of FDI a parent country has in a host country and potential determinants of a gravity model, skilled labor differences, and cultural proximity variables for the years 2000 and

2004. Through the use of fixed effects panel and first differenced estimation techniques on the aggregate flows dataset market potential, information, natural resources, and the occurrence of an attempted coup are found to be positive and significant determinants of FDI. Using OLS estimation techniques for the specific pair flows dataset, a gravity model and cultural proximity are found to be positive and significant determinants of FDI, while skilled labor differences are found to have a negative and significant impact on FDI flows.

This paper reinforces the previously researched importance of market potential, information, natural resources, the gravity model, and cultural proximity. For the most part, the impact of stability, international trade, and skilled labor differences on FDI is not clearly seen. The most interesting finding in the paper is the positive and significant sign on the attempted coup variable, which appears to be showing investors regaining confidence in the government in power after they witness an attempted coup fail. This research sheds further light on global patterns of FDI flows, but it is only the first step of many that need to be taken.

# TABLE OF CONTENTS

<b>LIST OF FIGURES</b> .....	viii
<b>CHAPTER 1 INTRODUCTION</b> .....	1
The Changing Landscape of FDI Flows .....	1
Current State of FDI.....	5
Definitions and Common Motivations of FDI.....	15
<b>CHAPTER 2 LITERATURE REVIEW</b> .....	20
<b>CHAPTER 3 METHODOLOGY</b> .....	27
Research Questions .....	27
Modeling Approach .....	28
Data Description .....	31
<b>CHAPTER 4 EMPIRICAL ANALYSIS AND RESULTS</b> .....	40
<b>CHAPTER 5 DISCUSSION OF FINDINGS</b> .....	61
Empirical Summary and Future Research .....	61
The Future of International Investment Flows.....	63
Conclusion .....	64
<b>APPENDIX</b> .....	66
<b>REFERENCES</b> .....	86



## LIST OF FIGURES

Figure 1. Global FDI Inflows in Millions of US Dollars 1980-2010 .....	5
Figure 2. Market Potential Correlation Matrix .....	33
Figure 3. Stability Variables Correlation Matrix .....	35
Figure 4. Information, Infrastructure & Natural Resources Correlation Matrix.....	36
Figure 5. Trade Variables Correlation Matrix .....	37
Figure 6. Aggregate Flows Summary Statistics.....	37
Figure 7. Specific Pair Flows Descriptive Statistics .....	39
Figure 8. Specific Pair Flows Correlation Matrix.....	39
Figure 9. Summary of Basic Fixed Effects Panel Results for FDI Inflows .....	48
Figure 10. Summary of Basic Fixed Effects Panel Results for FDI per capita .....	53
Figure 11. Summary of First Differenced Models Results .....	57
Figure 12. Summary of Specific Pair Flows Models Results .....	60

# **Chapter 1**

## **Introduction**

The rapid rise of international investment flows over the last fifty years has dramatically shaped the world we are living in today. The continued rise of these flows, particularly investment flows to and from emerging markets will continue to have a huge impact on the world. In 2011 global foreign direct investment flows totaled 1.509 trillion US dollars (2.3% of the world's GDP), with developing countries receiving 50.1 percent of these flows (Reuters 2012). Recently investment flows have been slowly recovering from a dramatic decline, resulting from the 2007 United States subprime mortgage crisis. Tightened global credit markets and the high level of future uncertainty are the main explanations for the slow rate of recovery of global investment flows. Despite the recent decline and current slow growth of investment flows, international flows appear destined to recover and have a larger impact on the size and shape of the global economy. The reasoning behind the inevitable rise of investment flows is the returns they can provide investors as well as host countries. Emerging markets are projected to continue to represent a larger share of global foreign direct investment inflows and outflows, because of their high growth rates and their tremendous future potential. This paper will explore the current state of foreign direct investment, analyze what has previously driven investment flows, and discuss the future landscape of global investment flows.

### **The Changing Landscape of FDI Flows**

Over the last fifty years, global foreign direct investment flows (FDI) have increased dramatically, but the composition of participants and the type of flows have

experienced substantial changes. In 1970, global FDI inflows totaled 13.35 billion US dollars, and in 2010, global FDI inflows totaled 1.24 trillion US dollars, this is an increase of nine hundred and fifty percent. The rapid rise is even more impressive when 2008 inflows are taken into consideration, since 2010 values came after the global recession. In 2008, global FDI inflows nearly totaled two trillion US dollars representing an increase of roughly fifteen hundred percent (UNCTAD Dataset 2011). This remarkable rise can be attributed to several factors including global economic growth, decreased regulations, increases in technology, and more time for investors to observe international markets. The continued growth of developed countries has made them even more attractive for outside investors. Besides long established FDI destinations becoming larger senders and recipients of FDI flows, new countries have emerged as large destinations for global inflows and large contributors of global outflows. The largest of these new destinations are the emerging economies of Brazil, Russia, India, and China.

Traditionally foreign direct investment has consisted of investment going from one developing country to another. From 1950 to the early 1990's developed countries accounted for nearly all of the world's FDI flows (UNCTAD Dataset 2011). The main countries involved were Western European countries, the United States, and, Australia. The majority of these flows consisted of firms looking to enter or enhance their presence in outside markets similar to their domestic markets. As more firms started looking to offer their product or service in foreign markets the level of FDI from one developed country to another steadily rose over the forty year time period. This pattern of investment lead to early studies of FDI focusing mainly on monopolistic competition and

product differentiation, since nearly all source and host pairs had similar income levels, factor endowments, political institutions, and market systems in place.

Beginning in the early 1990's the traditional participants and patterns of investment flows began to change. This shift was driven by large the emerging markets of Brazil, China, India, and Russia becoming more open to outside investment flows. China first became open to investment flows in 1978, but did not experience a large increase in inflows until the early 1990's. The substantial increase in inflows during the 1990's was driven by continued investment friendly reforms being installed, and a strong economic performance over the time period (Fung et al 2004). Early investment flows into China were made primarily into the manufacturing sector with the intent of taking advantage of lower labor costs. Throughout the 1990's and 2000's the Chinese economy grew at an incredible rate, with annual growth rates of roughly ten percent for the time period. The rapid growth of the Chinese economy resulted in the majority of investment flows shifting from low cost production seeking flows taking advantage of low Chinese labor rates, to market seeking flows with investors looking to provide products and services to Chinese consumers. Flows to the other emerging economies did not take off until later, the late 1990's in the case of Brazil, and the mid 2000's in the case of India and Russia. Like China, flows to these countries have been promoted by their strong economic performance and their governments shifting from regulating to promoting FDI. In addition to the large emerging economies, smaller emerging markets have also experienced substantial rises in FDI inflows. In 2010, Angola, Argentina, Chile, Colombia, Indonesia, Kazakhstan, Peru, South Korea, Turkey, and Viet Nam all received FDI inflows of around 10 billion US dollars. These countries have been increasingly

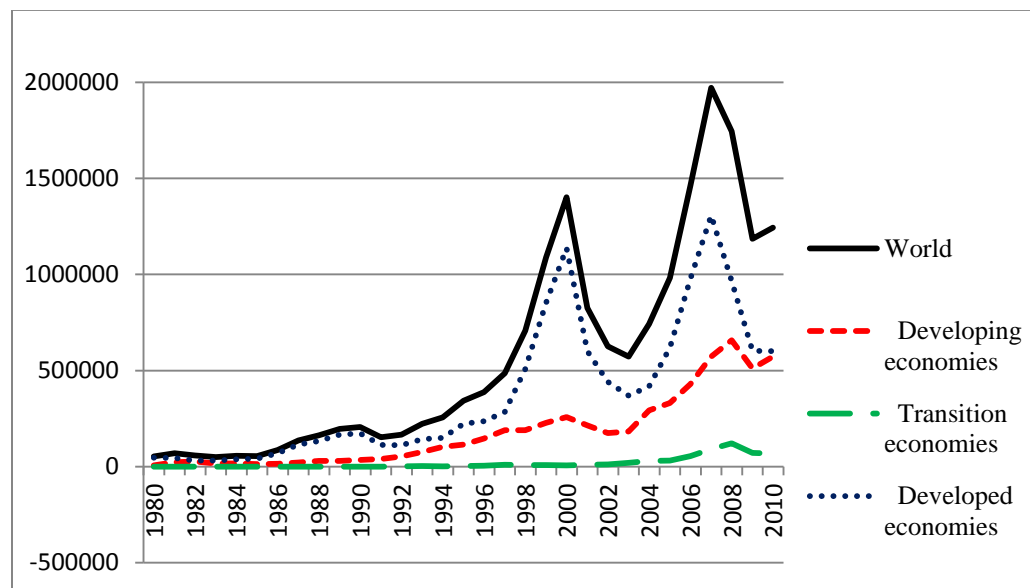
popular hosts of FDI flows due to their natural resource endowments, production possibilities, or growing markets. Today developing countries account for over half of the world's FDI inflows (UNCTAD Dataset 2011).

In addition to becoming larger recipients of FDI inflows, emerging markets have also become larger sources of FDI over the last twenty years. Investment flows from emerging countries led by the BRIC countries (Brazil, Russia, India, and China) began to take off in the early 2000's. These investments have taken place in a variety of endeavors, including resource extraction, manufacturing, and services and retail sectors. The demand for critical resources can be clearly seen in the pattern of FDI outflows from emerging and developing countries. Countries and companies looking to obtain scarce resources such as food, oil, minerals and water have greatly impacted FDI flows (Corula 2009). In China, state owned enterprises have been large sources of outward FDI flows, accounting for over eighty percent of outflows in the mid 2000's (OECD Global Forum 2009).

Following the global financial crisis of 2007 and 2008 FDI flows experienced a sharp decline. From 2008 to 2009 global FDI inflows decreased by over forty percent. This large decline resulted from the rapid tightening of global credit markets and high levels of uncertainty about the health of the global economy. FDI flows into all countries around the world experienced a decline because of the far-reaching effects of the 2007 subprime mortgage crisis that started in the United States. Companies became more focused on attempting to maintain current customers rather than expanding into new markets. Since 2008, the growth of FDI has been subdued, still not reaching 2008 highs. Developing and transition economies have been responsible for a large share of the

resurgence seen by global FDI flows, and since 2010 developing economies have accounted for over half of the world's FDI inflows. Figure 1 highlights the rapid rise of global FDI inflows over the last 30 years, the emergence of developing and transition economies, and the recent collapse and recovery of global FDI inflows. The next section discusses the current state of FDI and some of the trends occurring on a regional basis.

**Figure 1. Global FDI Inflows in Millions of US Dollars 1980-2010**



## Current State of FDI

Currently the world is experiencing a slow investment recovery, in terms of both foreign direct and portfolio investment flows. The uncertain state of the global economy has many investors taking part in the flight to safety, or simply standing on the sidelines. The current major source of global uncertainty is the European Sovereign Debt Crisis. The debt crisis is a financial crisis that has made it difficult for several European countries to re-finance their government debt. The countries most commonly discussed

are Greece, Ireland, Italy, Portugal, and Spain. Many factors contributed to the crisis including internationalization of finance, easy credit conditions, and bursting bubbles. The situation has been made worse by the fact that the global economy has just experienced and is still recovering from the 2007 United States subprime mortgage crisis, and the resulting severe global recession. The European countries previously listed are all experiencing a great deal of economic hardship as shown by their high current unemployment rates: Greece (21.7%), Ireland (14.5%), Italy (9.8%), and Spain (24.1%) (Eurostat 2012).

Even though the crisis appears to be isolated in one region of the world, the consequences have been felt by all regions of the world. The consequences of the sovereign debt and the subprime mortgage crises are felt globally because of how interconnected the global economy has become. The high level of international trade and the globalization of finance have left all regions of the world vulnerable to adverse effects in just one region. The high level of global trade has reinforced the sovereign debt crisis, due to the fact that Europe is a large market for exports. The resulting impacts of the sovereign debt and subprime crises have been devastating for exporting countries and countries that are dependent on external investments (Eichengreen 2010). The globalization of finance has made the effects of the crisis far reaching since assets in one country are now owned by economic agents from around the world. In the case of the European debt crisis, large banks from all over the world were able to purchase debt, meaning the crisis has left banks from around the world vulnerable. Next, the current state of FDI flows in each region of the world will be analyzed.

## *Europe & Russia*

The region currently drawing the most attention from global investors is the European Union. The uncertain state of the European Union has investors within and outside the region extremely nervous, due to the ongoing sovereign debt crisis and the poor economic conditions in many of the countries. Foreign direct investment outflows from the European Union have declined dramatically from 1,199,325 million US Dollars in 2007 to 407,251 million US Dollars in 2010, a 66% decline. FDI inflows also declined dramatically from 850,528 million US Dollars in 2007 to 304,689 million US Dollars in 2010, a 64% decline (UNCTAD Dataset 2011). Next to Europe is Russia, not receiving as much attention as the European Union, but still a large player in the terms of FDI flows. In 2010, Russian FDI inflows totaled 41,194 million dollars, a 25% decline from 2007 levels. Outflows experienced growth over the same time period; in 2010 they totaled 51,697 million US dollars, a 12.6% increase (UNCTAD Dataset 2011). Given the poor global performance, investors inside and outside the European Union experienced major equity losses and pulled many of their international investments to focus on their core activities in their domestic market. The majority of the outward and inward FDI from the EU countries goes to or comes from other EU member countries (Eurostat 2012). The top destinations of European Union outflows (3,665,000 million euros) outside the EU in terms of current FDI stocks are developed countries, precisely broken down: United States (30.9%), Switzerland (13.7%), Canada (4.3%), and Brazil (3.6%). The main sources of FDI going into the European Union (2,707,200 million euros) are the United States (38.6%), Switzerland (12.9%), Australia (5%), and Canada (4.4%) (Eurostat 2012). The European countries that represent the majority of FDI inflows and



outflows are Belgium, Germany, France, the United Kingdom, and the Netherlands (Impacts of Outward EU FDI 2010). The areas experiencing the largest recent (2007-2009) growth in FDI from the European Union are South Africa, Singapore, Russia, Brazil, and Australia, while the largest growing sources of FDI over that same time period are Hong Kong, Brazil, Australia, and Canada (Eurostat 2012). The majority of outward (71.5%) and inward (82.8%) of FDI flows went to the services sector, with the majority being financial and business services. The next largest source of FDI outflows (19.4%) and inflows (13.1%) are manufacturing investments (Eurostat 2012). Overall services flows to and from developed countries make up the majority of outward and inward FDI from the European Union, but flows to and from emerging economies are experiencing a substantial amount of growth. In 2011 greenfield investment in Europe declined by three percent, with the majority of new flows going into renewable energy, real estate, transportation, business services, and information technology industries (fDi Report 2012). The countries receiving and sending the majority of the new project funding are The United Kingdom, Germany, and France. New projects going into Russia are taking place primarily in the natural resource and manufacturing sectors (fDi Report 2012). The outlook of flows into and out of Europe and Russia remains uncertain at best with concerns of a severe recession for the Eurozone being discussed.

#### *United States & Canada*

The United States and Mexico have also experienced recent declines in the level of FDI inflows and outflows. In 2007, North America had FDI inflows totaling 360,339 million US dollars, but declined by twenty five percent to 270,341 million US dollars in 2010. Outflows experienced a similar pattern declining seventeen percent from 459,500

US dollars in 2007 to 381,835 million US dollars in (UNCTAD dataset 2011). The majority of North American inflows go to the United States, inflows (84.5%) and outflows (86.7%). The United States is the largest source and host of FDI in the world. The largest source foreign direct investments into the United States come from the United Kingdom, Japan, The Netherlands, Germany, Canada, and France (CRS 2012). Overall developed economies account for over ninety-five percent of FDI in the United States. The majority of these investments take place in the manufacturing sector (32%), the banking and financial services sector (20%), the retail and wholesale sector (16%), the information sector (6.7%), services sector (3.4%), and the real estate sector (2.1%). The remaining twenty percent of FDI inflow is divided amongst all other sectors (CRS 2012). The majority of United States outward FDI goes to developed countries, but recently emerging markets have continued to gain the interest of United States investors. Following the financial crisis United States average quarterly outward FDI flows to developed markets declined by 39%, while flows to developing markets declined by only 14% (Columbia FDI Profile 2010). The recent United States attraction to emerging markets has occurred due to their growing consumer markets, their higher rates of return, and the ability to be more sheltered from the performance of the global economy. Greenfield investment in the United States and Canada experienced modest growth in 2011 with the majority of new inflows and outflows going into the states of California and New York and the province Ontario. The majority of new inflows went into the energy, chemicals, transportation, and raw materials sector (fDi Report 2012). The outlook for United States inflows and outflows is uncertain in the short term, but continues to pick up as regional and global economic growth begin to pick up pace.

## *Latin America*

An area experiencing high growth in investment flows and currently holding a lot of future potential is Latin America. The region received inflows of 129,782 million US dollars, which is only a 6.2% decline from 2007 levels, and when Mexico is excluded from the group, the region experienced a 2.2% increase over the same time period. Over the same time period FDI outflows have rapidly risen to 61,407 million dollars, a 93.9 percent increase since 2007 (UNCTAD dataset 2011). The major source and host of FDI in the region is Brazil, which had FDI inflows of 48,438 million US dollars and outflows of 11,519 million US dollars in 2010. Behind Brazil, the main sources and hosts of FDI in Latin America are Mexico, Chile, Peru, Columbia, and Argentina (Merco Press 2012). When considering Caribbean nations, the British Virgin Islands and the Cayman Islands are also large senders and receivers of FDI, primarily through the financial services sector. A unique phenomenon occurring in Latin America is the fact that they are receiving high levels of FDI inflows from both developed and developing countries (World Investment Report 2011). Investments from developed countries take place primarily in the form of greenfield investment, and come mostly in the services sector. The main services developed countries are investing in are financial, business, and communication services. Foreign direct investments from developing countries in Latin America are taking place primarily in the form of mergers and acquisitions. These investments are going primarily into natural resource extraction operations, in the form of coal, oil, natural gas, and mineral extraction. The countries accounting for the majority of the surge of developing country FDI in Latin America are China and India (World Investment Report). In terms of greenfield investment in 2011, Latin America

experienced rapid growth, primarily in the sectors of natural resource extraction and information technology. Again, the countries receiving the majority of these new flows are Brazil, Mexico, Argentina, and Chile (fDi Report 2012). Foreign direct investment inflows and outflows from Latin America are anticipated to continue to rise going forward, given the continued recovery of the global economy, spurred by the rapidly emerging markets of Brazil, Argentina, Mexico, and Chile.

### *Asia*

Asia has been and continues to be a rapidly growing host and source of foreign direct investment. Currently China and Hong Kong are leading the way, both with inflows and outflows of over fifty billion dollars in 2010. Behind these countries is another group of large FDI players including Japan, India, Singapore, Korea, Indonesia, and Malaysia (World Investment Report 2011). In 2010, the entire geographic region of Asia received FDI inflows of 299,653 million US dollars, which is a 13.3% increase from 2007 values. A similar pattern was seen with outflows, totaling 231,685 million US dollars in 2010, a 20 percent increase from 2007 (UNCTAD dataset 2011). Despite the continued high flows of FDI into Asia, the landscape of flows to the region is continuously changing. An example of this continuously changing landscape are rising labor and production rates in China leading to increased low cost seeking FDI inflows going into countries like Indonesia and Viet-Nam (Columbia Vale FDI Profile 2010). Even though China is losing low cost seeking inflows, they are continuing to gain investment inflows in the form of high technology manufacturing, services, and other market seeking FDI inflows. The gained inflows have more than offset the lost flows resulting from rising production costs (Columbia Vale FDI Profile 2010).

Recently the major sources of FDI into China are from other Asian countries. In 2010, Hong Kong, Japan, Taiwan, South Korea and Singapore accounted for nearly forty percent of FDI inflows going into China. The United States and the United Kingdom, were the next largest investors each accounting for seven percent of FDI inflows to China (World Investment Report). India is also experiencing tremendous inward FDI flows, totaling 24,640 million US dollars in 2010 (UNCTAD dataset 2011). The majority of investments into India are coming from Mauritius, Singapore, The United States, and the United Kingdom. This pattern is similar for other Asian countries, but they are becoming increasingly attractive destinations for FDI from further away developed and developing countries. As mentioned earlier, Asia has recently been responsible for a large share of the world's outward FDI, with the funds going into a wide range of different endeavors. A large share of outward FDI is going to extraction based activities, led by the emerging markets of China and India, who are looking to acquire resources for their rapidly growing economies (World Investment Report 2011). Investments from the developed countries in the region are going primarily into the manufacturing and service industries as market seeking investments via mergers and acquisitions as well as greenfield investments. Currently there is a high level of new investment projects being undertaken in the region, led by China, India and Singapore. These investments are going into a variety of projects, with the majority taking place in the natural resource, chemical, transportation, and business services sectors (FDI Report 2012). Investment into and out of Asia is anticipated to continue growing, but at a slower rate in the near future, due to the anticipated slowdown of the Chinese economy.

## *Middle East*

Foreign direct investment flows into and from the Middle East are also still recovering from the global financial crisis. In 2010, FDI inflows into the Middle East totaled 58,193 million US dollars, which is a 25.6% decline from 2007 values. Outward investment also experienced a similar decline totaling 12,999 million US dollars, a 62% decline (UNCTAD Dataset 2011). The majority of inflows coming into the Middle East from outside investors are coming from developed countries and taking place primarily in the natural resource sector. The largest recipient countries in the region are Saudi Arabia, Turkey, and Qatar, while the largest source countries are Saudi Arabia, Kuwait, and the United Arab Emirates (World Investment Report 2011). The majority of outflows from the region have come from government owned enterprises, accounting for 74% of mergers and acquisition flows and 47% of greenfield investment outflows. The majority of mergers and acquisitions investments have taken place primarily in developed countries, while the majority of greenfield investments have taken place in developing countries (World investment Report 2011). In 2011, the top source countries for new projects were the United Arab Emirates, Saudi Arabia, and Qatar while the top host countries were the United Arab Emirates, Saudi Arabia, and Israel (fDi Report 2012). The future outlook for FDI flows to and from the region is uncertain given the high level of political instability currently taking place in several countries and the uncertain outlook of the global economy. The region also possesses tremendous potential given its natural resource endowments and the continuing global demand for energy, and excellent location with close access to both Europe and Asia.

## *Africa*

Africa as a region is beginning to experience more FDI inflows, but overall Africa is only receiving a small share of FDI inflows. In 2010, the entire continent of Africa received FDI inflows of 55,040 million US dollars, which is a 14.3 percent decline from 2007 total inflows. The 2010 inflows accounted for only ten percent of all FDI flows to developing countries. Outflows from Africa are even smaller totaling 6,636 million US dollars in 2010, a 39.5% decline from 2007 (UNCTAD dataset 2011). The largest sources and hosts of FDI in Africa in 2010 were Angola, Egypt, Libya, and Nigeria. The majority of investments in these countries and Africa as an entire region have gone into natural resource extraction activities. In recent years, many African countries have implemented reforms making it easier for outside investors to set up operations. The majority of FDI inflows have come from developed countries. From 2000-2008 developed countries accounted for over 72% of FDI flows going into Africa (African Economic Outlook 2012). Flows from these countries experienced declines following the recent financial crisis, but they were not as large as the declines in inflows to other countries. Developing countries, led by China and India, have recently become large investors into African resources as well as other African markets (World Investment Report 2011). In 2011 South Africa, Kenya, Nigeria, and Morocco received a large increase in greenfield FDI. The new project funding was mainly put into resource extraction activities and manufacturing activities. Political instability significantly impacted flows to Northern Africa in 2011 (fDi Report 2012). Africa has tremendous potential for future FDI inflows given its natural resource and low cost labor

endowments. Despite its tremendous potential, political risk and limited information will still serve as significant stumbling blocks for future flows.

Despite the recent pullbacks, slow recovery, and current state of uncertainty investors still have plenty of incentives to invest internationally in the future. Investors will still look internationally if they believe they can obtain a higher return than they can obtain domestically. As investors become more confident in the global economy, they will become more willing to take on higher amounts of risk to obtain a higher return. This process will start with more foreign direct investors beginning to consider potential projects, and with portfolio investors ending the current flight to safety. The process will start out slow with investors looking at investments in regions they are the most familiar with, but as the global economy continues to grow investors will look to regions they are less familiar with in pursuit of a higher return. The next two sections of the paper specifically highlight the rise of emerging markets and the FDI divide that is taking place. Now that the current state of FDI has been briefly discussed, the next section of the paper will define some important terms and discuss the most common motivations of FDI.

## **Definitions and Common Motivations of FDI**

Foreign direct investment (FDI) is generally defined as an investment made by a domestic entity in a foreign country acquiring at least ten percent of voting stock, or simply ten percent of ownership if the firm is not publically traded. An investment that does not meet the ten percent of voting stock minimum requirement is known as portfolio investment. Foreign direct investment is often considered to be a much more stable or tied down form of investment since firms have a large illiquid position compared to



portfolio investment, where investors can quickly get in and out of a particular investment. Foreign direct investment can take the form of investment in a new project, known as greenfield investment, or an investment made in an existing operation through a merger or acquisition, known as brownfield investment. In 2011, greenfield investment totaled 780.4 billion US dollars, while brownfield investment totaled 507.3 billion US dollars, and the remaining investment flows came in the form of reinvested earnings (Reuters 2012). Another important distinction that is made is between horizontal and vertical FDI. Horizontal FDI refers to an investment made by a firm to provide a similar product in a host country as they provide to domestic markets. Vertical investment flows refer to an investment made in a host country, but at a different place in the value chain (either upstream or downstream) than domestic operations. The basic motivation for all foreign direct investment is to obtain a return, but the method of maintaining returns differs. The most common motives of foreign direct investment are described below.

#### *Market Seeking Foreign Direct Investment*

Market seeking foreign direct investment is an investment made by a foreign firm in a domestic market with the intent of reaching a new consumer base or maintaining one that it already has. This type of foreign direct investment flows usually falls under the category of horizontal FDI flows. Firms first identify the potential external markets they plan on entering or investing additional amounts into, and if they feel confident in a project they make the investments necessary to provide their product to the new market or increase their presence. An example of market seeking FDI is General Motors setting up production facilities in China then selling the cars to Chinese consumers. The main motivation for market seeking FDI is that it is a more efficient process of getting a

product to foreign consumers. Firms often prefer market seeking FDI over international trade and outsourcing because it allows them to avoid trade costs and they can make sure all production and sale activities are done correctly. Another factor contributing to market seeking FDI flows is the fact that certain industries require production and distribution to happen contemporaneously. Examples of industries where this occurs are telecommunications, water supply, and energy supply. Today reaching new markets remains a top priority of many multinational firms, which explains the prevalence of market seeking FDI flows. Today market seeking flows represent the majority of global foreign direct investment.

#### *Resource Seeking Investment*

Resource seeking investment is an investment made by a foreign firm in a domestic market with the intent of extracting or refining a particular natural resource like minerals, natural gas, oil, and timber that are not abundantly available in the firm's home market. This type of investment flow falls into the category of vertical FDI. An example of a resource seeking foreign direct investment is British Petroleum obtaining the right to drill for oil in the United States and setting up operations. Resource seeking FDI flows are often the predominant type of FDI flow into developing countries since many have an abundance of natural resources and underdeveloped domestic markets. Another more recent pattern occurring is that emerging market economies have become responsible for large shares of resource seeking FDI outflows. Firms and governments of emerging market countries are looking to obtain a particular natural resource like oil, coal, and natural gas that is needed in the rapidly growing domestic economies.

### *Efficiency Seeking Investment*

Efficiency or low cost seeking investment is an investment made by a foreign firm in a domestic market with the intent of lowering production costs. Efficiency seeking investment falls under the category of vertical FDI flows. Firms taking part in low cost seeking FDI will be looking to place operations where they minimize costs. The most commonly discussed form of low cost seeking FDI is multinational firms setting up manufacturing operations in countries with low labor costs and close access to the required inputs. The product is then often sold to a market in an outside country. This type of process often occurs when low cost labor production can take place next to a large developed market. An example of efficiency seeking FDI is Dell Computer setting up a service call center in India to take advantage of lower labor rates. The landscape of low cost flows continues to change as growing countries experience rising labor rates, which creates opportunities for other developing economies.

### *Strategic Asset Seeking Investment*

Strategic asset seeking investment is an international investment made by a firm with the intent of obtaining or enhancing its global competitive advantage. This type of investment can come in the form of both horizontal and vertical FDI. An example of a strategic asset seeking investment is British Petroleum buying the right to extract oil in a particular country even though they have no plans to enter the region in the near future. The motivation behind this investment is to keep the oil rights out of competitor's hands. Cases of strategic asset seeking foreign direct investment are also seen when a firm enters a new market at a loss. Even though the new market may not be currently profitable, it may have a lot of future potential. Entering a market early and establishing a presence

with the consumer base can give firms a huge advantage over the competition. This paper will examine the influence the traditionally discussed motivations of market potential and natural resources and efficiency seeking, as well as the role stability, trade, information and infrastructure have played in the pattern of FDI flows taking place. The next section briefly reviews the main contributions to the field of FDI research.

## Chapter 2

### Literature Review

The first research on foreign direct investment determinants used the Heckscher-Ohlin model as an explanation for global capital flows. Papers by Jasay (1960), MacDougall (1960), and Kemp (1964) predicted capital to move from capital abundant countries to capital scarce countries. This view was expanded by Aliber (1970), who stated that capital moves due to differences in capital returns (Faeth 2009). Aliber discussed the fact that more factors other than just capital scarcity influence the returns in different regions. Aliber highlighted differences in capital returns as well as tax differences, currency risk differences, interest rate differences, and political risk differences. Expectations of currency depreciation were discussed in detail as a factor that could draw investors into a particular country, since their returns will be even higher than the anticipated market rate of the country they invest in. The underlying theme of the paper is that firms are anticipated to weigh all the factors that influence their expected return, and invest in the country that generates the highest expected capital return.

The next major wave of research explaining what drives FDI flows is the *Ownership, Location, and Internalization (OLI) approach* to explaining foreign direct investment flows (Faeth 2009). Ownership advantages refer to the advantages that come with owning an operation abroad. An example of an ownership advantage is having a process or a technique that gives a firm a comparative advantage in the production and eventual sale of a good or service. The first research on ownership advantages came from Kindelberger (1969), Caves (1971), and Hymer (1976). The authors all stated their

beliefs that foreign direct investment was occurring in imperfect markets rather than the perfect ones outlined by the Heckscher-Ohlin based models. Caves (1971) spelled out product differentiation as a monopolistic advantage that pushed firms into new markets via horizontal FDI flows. Kindleberger (1969) and Hymer (1976) had the same view of monopolistic advantages as making horizontal FDI flows both possible and profitable. Along the same lines of ownership advantages are “Follow-the-Leader FDI” discussed by Knickerbocker (1973) and “diversification advantages” discussed by Rugman (1979). “Follow-the-Leader FDI” refers to companies investing in foreign countries after their competition already has. Diversification advantages refer to firms diversifying their business operations in multiple locations, so they are hedged against an adverse performance in the domestic market (Sethi et al 2003).

Location advantages refer to the advantages that are associated with investing in a particular region. In a research paper, Dunning (1980) states that multinational firms generally invest in the most advantageous location. Factors that could make a host country a more favorable location include lower tax rates, tax exemptions, large or growing domestic markets, well developed infrastructure, stable government, low wage rates, and natural resource abundance. Different location advantages will take on larger weights depending on the type of potential foreign direct investment. For example a natural resource extraction firm will only invest in a country that has the resource they are extracting, and if they are able to establish a contract with the host country. The other factors may add or detract from a given country’s attractiveness, but they will not be seen as fundamental in the decision making process. Dunning (1981) as well as several economists, including Ozawa (1992) and Narula (1996) later added that the country’s

stage of economic development plays a large role in the type of foreign direct investment a country receives. The generally accepted phenomenon was that less developed countries were more attractive locations for resources seeking and efficiency seeking FDI inflows. As these countries develop and achieve economic, technological, infrastructure, and human capital improvements they will be more attractive locations for “greater value added” FDI inflows. Eventually these countries will receive mainly market seeking FDI inflows (Sethi et al 2003).

Internalization advantages refer to the advantages that come along with keeping a particular operation internal to the firm rather than having it outsourced. Dunning (1979) argued that internalization occurred because of the public good nature of ownership advantages. Examples of internalization include lower transaction costs, limiting technology imitation, maintaining a firm’s reputation, and ensuring all processes are done correctly. As long as cost savings through internalization are greater than the cost savings of outsourcing, shipping and exporting, foreign direct investment operations should be used. Dunning believed that internalization advantages were greater in research and development, technology, and marketing intensive industries, and would represent a larger portion of foreign direct investment flows (Faeth 2009).

A significant amount of research has been conducted examining the risk diversification advantages foreign direct investment gives firms. The first discussion of diversification advantages came from Rugman (1975), who contended that firms set up operations in other countries to obtain product and factor market diversification and reduce the variance in their profits. Michel and Shaked (1986) found that United States firms who had operations in multiple countries had lower total and systematic risk than

firms who only operated in the domestic market. Kim, Hwang, and Burghers (1993) found that it was possible for multinational firms to obtain a high return low risk profile when they take steps to diversify on both a geographic basis and a product basis. Risk diversification advantages are consistently mentioned as a benefit of FDI in the previous literature, but they are never mentioned as the main motivator for investment flows.

A significant amount of research has been done looking exclusively at vertical foreign direct investment flows. Vertical investment flows refer to investments made into specific production processes of the value chain. In his paper, Markusen (1997) states the main motivation for vertical foreign direct investment is carrying out labor and resource intensive production in locations with abundant supplies of low skilled labor and natural resources. Under this assumption, differences in relative factor endowments are expected to explain vertical FDI flows. Brainard (1993) finds no evidence of factor endowment differences leading to increased vertical FDI flows when analyzing multinational enterprises from the United States. Using a similar technique, and interacting factor endowments with industry factor intensities, Yeaple (2003) finds evidence that relative factor intensity differences do motivate vertical FDI flows when the host country has the comparative advantage in the given factor of production.

A large amount of research has been devoted to looking exclusively at horizontal foreign direct investment flows. Horizontal FDI refers to investments made in foreign firms in host countries similar to those in the parent country. The goal of horizontal FDI is generally to reach new markets with the same product or service that is already being provided domestically. Markusen (1997) describes firm's desires to place production closer to consumers and avoid trade costs as the main motivations for horizontal FDI.



Firms participating in horizontal FDI will be looking to invest in markets with the most potential, but also carefully weigh other specific host country characteristics like trade costs, tax rates, and political conditions. Carr et al (1998) combined the vertical and horizontal motivations into one model, which they called the knowledge-capital model. The model was then tested using data from thirty seven countries, yielding expected and significant signs for both vertical and horizontal foreign direct investment. These findings were disputed by Blonigen et al (2002), who contended that Carr's work misspecified the variables measuring skilled labor abundance. Blonigen's model found support for horizontal FDI, but not vertical FDI in the knowledge capital model. In a later paper, Blonigen (2005) concludes that general FDI patterns are driven by horizontal FDI, and that vertical motivations are only noticed when analyzing specific manufacturing industries.

The next wave of FDI research has focused on the role specific determinants have in influencing the investment decision. In a 2007 paper, Blonigen et al discuss how critical market potential, being located next to or in a region with other countries with large market potential, is for obtaining FDI inflows. Another commonly researched determinant is stability. Busse and Hefeker (2007) find government stability to be a significant determinant of FDI inflows when analyzing developing countries from 1984-2003. In an analysis of credit availability, Harrison et al (2004) find that firms are significantly impacted by the availability of credit. The authors stress the importance of domestic credit institutions not over-lending to multinational firms, because of how vulnerable it would leave the domestic financial system. The roles of both market and exchange rate expectations have also been researched. Blonigen (2005) states that

market expectations play a significant role in FDI decisions and are clearly seen, but exchange rate expectations are harder to justify and find consistently. Blonigen outlines the example of foreign firms anticipating a currency movement looking to finish, delay, or hedge a deal. The role of information as a driver has also been researched. Razin et al (1999) find FDI is a way for investors to avoid the information asymmetries of other forms of investment, and that firms will look to obtain as much information as they can about a particular investment. In a study of FDI into Mexico, Mollick et al (2006) find the level of infrastructure to be a significant determinant of FDI, particularly telephone lines and other forms of international infrastructure. The authors suggest more government investments into international infrastructure since it is serving as a catalyst for FDI. Corporate tax rates as a determinant of FDI are examined by Benassy and Fontage (2005). In a study of FDI flows to OECD countries the authors find taxes to be a significant determinant of where multinational firms set up their operations. The data analysis and discussion of this paper will take a similar approach, looking at the potential variables that shape investment flows.

Another recent research trend is focusing on foreign direct investment into specific regions and specific industries. The reason for this shift is the complex nature of foreign direct investment, since different factors are driving different investments into different regions. To get a better understanding of one specific flow it is best to narrow the scope and focus exclusively on that flow whether it be only looking at one region or looking at a specific industry in a region. Blonigen (2005) makes the argument that it is important to analyze developed and developing countries separately when looking at the drivers of FDI. He contends that the factors driving investment to developing countries

are different from the factors driving investment into developed countries. In a paper titled “Determinants of FDI in Developing Countries: Has Globalization Changed the Rules of the Game?” by Nunnekamp and Spatz (2002), the impact of traditional determinants and globalization on developing countries are examined. The authors find the traditional market determinants to be the strongest, with little impact from globalization. Another specific region paper by Asiedu (2002) focuses on the determinants of FDI to sub-Saharan Africa. The findings are that sub-Saharan African countries do not experience the levels of FDI increases from infrastructure improvements, human capital increases, returns increases and increased openness as other developing countries. Another example of a specific area study is a paper written by Buckley et al (2007) that focuses on the determinants of outward Chinese FDI. The authors find that natural resources, cultural proximity, and political instability drive Chinese foreign direct investment. There are countless other specific region or industry papers providing more insight on global investment flows.

In conclusion, there has been a tremendous amount of research done analyzing the drivers of foreign direct investment flows. This review covers only a small sample of the total body of work on the drivers of FDI flows. Early studies focused on the role relative capital abundances played in explaining foreign direct investment flows, while recent studies have become more focused on specific determinants, regions, and industries. The next section details the exact research questions being analyzed, and how exactly they will be analyzed.

## Chapter 3

### Methodology

#### Research Questions

This paper will investigate the role market potential, stability, infrastructure, natural resources, and information have played in the pattern of global FDI flows. Previous papers by Davidson (1980), Blonigen et al (2007), and Sethi et al (2003) find the market potential variables of a country's real GDP, real GNP, and GDP growth rate to have a positive impact on FDI inflows. Stability is found to have a negative impact on FDI inflows by Busse and Hefeker (2007), but Sethi *et al* (2003) find the impact of stability to be mixed. Infrastructure, particularly telephone lines are found to have a positive impact on FDI flows by Mollick et al (2006). Papers by Narula (1996) and Asiedu (2006) have found natural resource abundance to have a positive impact on FDI inflows especially for developing countries. Sethi et al (2003) find previous years FDI stock (information measure) to have a large positive impact on FDI inflows. This paper will also examine the relationship between foreign direct investment and international trade. Arguments can be made for FDI and trade acting as complements or substitutes. The main substitutes argument is that FDI and exports are alternative methods of supplying a foreign market, meaning specific markets will either be supplied with products resulting from FDI inflows or with products being imported (Forte 2004). Dunning (1980) suggested that ownership, location, and internalization advantages would result in FDI being preferred to trade. The main complements argument is that FDI and trade are expected to work together, with certain activities being done more efficiently

through FDI and other activities being done more efficiently through trade. Papers by Aitken et al (1997), Aizenman and Noy (2006), Swenson (2007), and Sun (2009) find evidence of the complementary relationship between FDI and trade. To better understand the relationship between FDI and trade, the relationship between FDI inflows, manufacturing exports, manufacturing imports, service exports, and service imports will be analyzed over the time period of 1970-2010. The extent to which a gravity model explains FDI flows will also be examined using the specific pair flows dataset. Blonigen (2005) states that a gravity model explains a “reasonable amount” of FDI flows. In addition to the standard gravity determinants of FDI, the role cultural proximity plays in foreign investment decisions will also be analyzed. Papers by Dunning (1993) and Sethi et al (2003) find that cultural proximity has a positive impact on FDI inflows. Cultural proximity will be addressed in this paper by considering the impact of regional trade agreements, a common language, and a colonial link on FDI.

## **Modeling Approach**

To model the impact of market potential, stability, natural resources, infrastructure, information, and international trade on FDI inflows, a series of fixed effects panel regressions will be run on the aggregate flows dataset. The reason for using a fixed effects model is to control for unobserved differences across countries and years. The first model, the baseline model, includes only the variables measuring the market potential of a particular country: real GDP, population, and the GDP growth rate. This regression will provide some insight on the extent to which market seeking motives alone have influenced FDI flows. This basic market potential model will also be run in a per capita setting with real GDP per capita and the GDP growth rate as the independent

variables and FDI inflows per capita as the dependent variable. Next, the political and economic stability measures will be added to both models to measure the extent to which instances of instability have deterred foreign direct investors. Then the variables of FDI stock, internet users per one hundred people, and oil and mineral exports will be included in both the aggregate and per capita models to obtain a sense of what role information, infrastructure, and natural resources have played in the pattern of global FDI flows. Finally, the four trade variables are added to the two fixed effects panel regressions to examine the relationship between trade and FDI over the 1970-2010 time period. The modeling approach of starting with a baseline model and then adding blocks of independent variables is similar to the one used by Sethi et al (2003), except this paper uses fixed effects panel estimation techniques rather than ordinary least squares estimation. Another important difference is that the Sethi paper analyzes the inflows of 17 European and 11 Asian countries coming from the United States from 1980-2000, while this paper looks at all FDI inflows for 229 countries over the time period 1970-2010. It is important to note that the independent variables in these regressions are all lagged one time period to allow for the discussion of causality.

Next first differenced regressions will be run with the market potential, natural resources, and trade variables as independent variables. The reason for running the first differenced models is to account for the potential autocorrelation in the level variables. It is important to note the interpretation of the regressions will now be the change in FDI inflows regressed on the change in the independent variables. Just like before, the market potential variables will be included first, then the natural resource variables will be included, and then finally the trade variables. The stability and infrastructure variables

are omitted from the first differenced model because of their low level of variation, and the change in FDI stock is left out because its sign is difficult to interpret. First differenced techniques are also used in FDI inflows papers by Bevan and Estrin (2000), which analyzes the determinants of FDI inflows to transition economies, and Mollick et al (2006), which analyzes infrastructures impact on FDI inflows into Mexico.

The last section of the empirical analysis will consist of running basic ordinary least squares regressions on the specific pair flows dataset. The first regression analyzes a basic gravity model of FDI, including three gravity variables: parent country real GDP, host country real GDP, and the distance in kilometers between the two country's most populous cities. The signs on both real GDP variables are expected to be positive since larger economies will be larger hosts and sources of FDI. The sign on the distance variable is expected to be negative since closer economies will be more likely to set up operations in each other. Next, the skilled labor difference squared will be included in the model to measure the extent to which low cost seeking flows are taking place. The reason why this variable is squared is to measure positive and negative differences the same way. This will provide a measure of whether or not FDI flows are taking place between countries with similar skilled labor endowments; a positive sign on the coefficient will indicate more process oriented flows, while a negative sign will indicate more market seeking flows. Finally, the cultural proximity variables will be included in the model to measure the degree to which cultural proximity positively influences the amount of FDI going from one country to another. The book "Foreign Direct Investment: Analysis of Aggregate Flows" by Razin and Sadka (2007) uses a similar approach, with pair specific aggregate flows as the main dependent variable throughout

the analysis. The next section will describe the variables used from both the aggregate flows and specific pair flows dataset.

## **Data Description**

In an effort to statistically analyze the research questions, two datasets will be used. The aggregate flows dataset consists of country specific aggregate variables measuring FDI inflows as the dependent variables and predicted determinants as the independent variables. The dataset consists of 229 countries over the time period of 1970-2010, with the data being compiled from multiple sources. It is important to note that not all countries have observations for each variable over the entire time period. This is either due to a particular variable not being available for a particular country in a particular year, or a country simply not existing. An example of the second phenomenon is 1980 data not being available for Russia, since Russia was the Soviet Union in 1980. The second dataset that will be analyzed is the specific pair flows dataset, which uses the FDI position of a parent country in a particular year as the dependent variable. The dataset contains 9167 total FDI positions for the two years 2000 and 2004. This allows for variables describing the host country, variables describing the parent country, and variables describing the relationship between the host and parent country to be used as independent variables. This dataset was obtained from Bruce Blonigen at the University of Oregon, and like the aggregate flows dataset the data is compiled from multiple sources.



### *Aggregate Flows Dataset*

The dependent variables used in the aggregate flows empirical analysis will be FDI inflows and FDI inflows per capita. The value of FDI inflows is measured in US dollars and is calculated by totaling the sum of equity capital, reinvested earnings, and other capital flows meeting the FDI requirements that are recorded in the balance of payments. The FDI per capita is simply the FDI inflows divided by a given country's population in a particular time period. It is important to note that FDI inflows values can be negative representing "net disinvestment." The calculation used to measure FDI inflows for a particular year is given by the equation below.

$$FDI\ Inflows = New\ Investment\ Inflows - Disinvestment\ Flows$$

All of the FDI data was gathered from or calculated using data from the United Nations Conference on Trade and Development (UNCTAD) dataset. The collected data contains 7,731 FDI inflows observations, with the average level of FDI inflows equaling 2.32 billion US dollars. Additional descriptive statistics are included in the aggregate flows summary statistics table, listed under Figure 6 below.

The first set of independent variables consists of the market potential variables: real GDP, real GDP per capita, population, and GDP growth rate. The data for both real GDP and real GDP per capita variables were obtained from the UNCTAD dataset and are measured in US dollars. Both variables have 7,907 observations and display a large amount of variation. The real GDP average is roughly 161 billion US dollars and the standard deviation is 743 billion dollars. The real GDP per capita average is 8,357 US dollars, with a minimum value of 68.98 US dollars and maximum value of 88,585 US

dollars, showing that the range of countries in the dataset goes from wealthy to extremely poor. The population variable was collected from the World Bank’s Human Development Indicators dataset. Like the previous market potential measures, population has a wide range of values with a minimum value of 5,632 people (Turks and Caicos Islands 1970) and a maximum value of over 1.34 billion people (China 2010), with the average of the observations equaling 25.8 million people. The GDP growth rate variable was also collected from the World Bank’s Human Development Indicators dataset. The variable has 6,660 observations with a mean value of 4.26 percent, and a standard deviation of 9.94 percent. Detailed descriptive statistics of the market potential variables are included in the aggregate flows summary statistics listed under Figure 6 below, and a correlation matrix of the measures against each other and FDI inflows is listed under Figure 2 below. For the most part all variables show a positive correlation with FDI inflows and each other.

**Figure 2. Market Potential Correlation Matrix**

	<b>FDI Inflows</b>	<b>Real GDP</b>	<b>Population</b>	<b>GDP Growth</b>
<b>FDI Inflows</b>	1			
<b>Real GDP</b>	0.6717	1		
<b>Population</b>	0.2647	0.2936	1	
<b>GDP Growth</b>	-0.0107	-0.0284	0.0277	1

The next group of independent variables in the aggregate flows dataset include the stability variables, which are broken down into political stability variables and economic stability variables. The political stability variables consist of data on the number of actual coup d'états, the number of attempted coup d'états, the number of confirmed

plotted coup d'états, and the number of allegedly plotted coup d'états happening in each country yearly from 1970 to 2010. The data was collected from the Polity 4: Regime Authority Characteristics and Transitions dataset (accessed at <http://www.systemicpeace.org>). The variable is equal to zero for the majority of observations, and if a country does experience one of the unstable occurrences, it is usually just one. The only variable where this is not the case is the number of attempted coups, which includes 24 observations where a country experienced two attempted coups in a year, one observation where a country experienced three and one observation where a country experienced four. In addition to the four instability variables, dummy variables of each unstable event are also generated, equaling a value of 1 if at least one unstable event occurred and 0 otherwise. This will provide a measure of what the presence of instability means as well as what a high amount of instability means for investment inflows into a country. The economic stability variables are exchange rate volatility and the inflation rate. The exchange rate data was collected from the International Monetary Fund's International Financial Statistics dataset. The average annual exchange rate per *sdr* was collected for each year, then the volatility measure was calculated using the following equation.

$$\text{Exchange Rate Volatility} = (\text{exchange rate}_t - \text{average exrate}_{1970-2010})^2$$

The variable has a large range, with the minimum value equaling zero and the maximum value equaling  $1.07e^{21}$ . The inflation rate data was collected from the World Bank's Human Development Indicators, and is simply the inflation rate of consumer goods for each year in each country. The average inflation rate is 38.53 percent, with a minimum value of -21.5 and a maximum value of 24,441 percent. The correlation matrix for

stability variables is presented in Figure 3 below, which reveals a low level of correlation. The detailed summary statistics are included in Figure 6, the aggregate flows summary statistics table.

**Figure 3. Stability Variables Correlation Matrix**

	<b>FDI Inflows</b>	<b>Successful</b>	<b>Attempted</b>	<b>Plotted</b>	<b>Rumored</b>	<b>Ex. Rate Vol.</b>	<b>Inflat. Rate</b>
<b>FDI Inflows</b>	1						
<b>Successful</b>	-0.0247	1					
<b>Attempted</b>	-0.0306	0.0742	1				
<b>Plotted</b>	-0.0188	0.0155	0.0128	1			
<b>Rumored</b>	-0.0189	-0.0016	0.0687	0.0351	1		
<b>Ex. Rate Vol.</b>	-0.0183	-0.0107	-0.0129	-0.0087	0.0879	1	
<b>Inflat. Rate</b>	-0.0127	-0.0035	0.0009	0.0342	0.081	0.1082	1

The next block of aggregate flow variables analyzed are the information, infrastructure, and natural resources variables. The information variable is the FDI stock, which measures the total level of FDI a country is receiving in a particular year. The data was collected from the UNCTAD dataset. The variable is measured in US dollars just like the FDI inflows variable. The FDI stock variable has 6,049 observations with a mean value of 30.7 billion US dollars and a standard deviation of 160.1 billion US dollars. The infrastructure variable included is the number of internet users per one hundred people, which was collected from the World Bank's Human Development Indicators dataset. The variable has only 3,526 observations with multiple locations having the minimum value of zero and the maximum value of 95.64. The natural resource variable is represented by the US dollar value of oil and mineral exports, which was collected from the World Trade Organization's Time Series on International Trade

dataset. The variable has 4,104 observations with multiple minimum values of zero and a maximum value of 342 billion US dollars (Russia 2008). The detailed descriptive statistics are shown in the aggregate flows summary statistics table, and a correlation matrix of the three variables and the independent variables is included below. The variables all show a high level of correlation with each other and the FDI variables.

**Figure 4. Information, Infrastructure & Natural Resources Correlation Matrix**

	<b>FDI Inflows</b>	<b>FDI Stock</b>	<b>Internet Users/100</b>	<b>Oil &amp; Mineral Exports</b>
<b>FDI Inflows</b>	1			
<b>FDI Stock</b>	0.8374	1		
<b>Internet Users/100</b>	0.3249	0.3834	1	
<b>Oil &amp; Mineral Exports</b>	0.3885	0.3569	0.3253	1

The final group of variables in the aggregate flows dataset are the trade variables, which consist of the US dollar value of manufacturing exports, manufacturing imports, service imports, and service exports. The variables were all collected from the World Trade Organization’s Time Series on International Trade dataset. There are roughly four thousand to five thousand observations for each variable, and each has a high level of variation. Detailed descriptive statistics are presented in the aggregate flows summary statistics table listed under Figure 6. The correlation matrix of the trade variables and FDI inflows is given in Figure 5 below. Notice the high level of correlation between the variables and FDI inflows and among the trade variables.

**Figure 5. Trade Variables Correlation Matrix**

	<b>FDI Inflows</b>	<b>Man. Exports</b>	<b>Man. Imports</b>	<b>Serv. Exports</b>	<b>Serv. Imports</b>
<b>FDI Inflows</b>	1				
<b>Man. Exports</b>	0.6752	1			
<b>Man. Imports</b>	0.8291	0.9017	1		
<b>Serv. Exports</b>	0.805	0.8396	0.9446	1	
<b>Serv. Imports</b>	0.7348	0.9053	0.9245	0.9497	1

**Figure 6. Aggregate Flows Summary Statistics**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Minimum</b>	<b>Maximum</b>
FDI Inflows	7731	2.32E+09	1.23E+10	-3.17e+10	3.14E+11
Real GDP	7906	1.61E+11	7.43E+11	6261800	1.33E+13
Population	8341	2.58E+07	1.04E+08	5632	1.34E+09
GDP Growth Rate	6660	4.258413	9.944017	-51.0309	157.842
Successful Coup	9389	0.0124614	0.1137828	0	2
Attempted Coup	9389	0.0244968	0.1758677	0	4
Plotted Coup	9389	0.007349	0.0878742	0	2
Rumored Coup	9389	0.0101182	0.1000845	0	1
Ex. Rate Vol.	6622	1.66E+16	1.32E+18	0	1.07E+20
Inflation Rate	5535	38.53516	524.9983	-21.675	24411.03
FDI Stock	6049	3.07E+10	1.60E+11	0	3.55E+12
Internet	3526	13.43658	21.15256	0	95.63811
Oil and Mineral Exports	4104	6.85E+09	1.89E+10	0	3.42E+11
Man. Exports	4147	2.97E+10	9.92E+10	0	1.48E+12
Man. Imports	4162	3.02E+10	9.38E+10	30744	1.42E+12
Serv. Exports	4973	8.51E+09	2.89E+10	379000	5.18E+11
Serv. Imports	5015	7.97E+09	2.51E+10	537720	3.65E+11

*Specific Pair Flows Dataset*

The dependent variable in the specific pair flows regressions is the total FDI position a parent country has in a host country in a particular year measured in millions of US dollars. Unlike the aggregate flows dataset the dependent variable is a stock not a flow, meaning it is the total amount of FDI a parent country has in a host country in given

year. The dataset contains 9,167 specific pair observations, with a mean value of 1.49 billion US dollars, a maximum value of 330 billion US dollars (US investment in the United Kingdom in 2004), and a minimum value -1.65 billion US dollars (New Zealand investment in the Netherlands in 2000). It is important to note that the data set contains data on nearly all countries ranging from large developed countries to small developing countries, but the majority of the pair flows data collected is on positions of developed countries in other developed countries.

The first set of variables are the gravity model variables of parent country real GDP, host country real GDP, and the distance in kilometers between the largest cities in the parent and host country. Both parent and host have a mean value of real GDP around 900 million US dollars. The maximum value for each parent host pair is 11.97 billion dollars (United States 2004). It is important to note that the variable is recorded in billions of US dollars so the coefficients can be correctly interpreted. The distance variable contains 8,701 observations, with a mean value of 7,456 kilometers, a minimum value of 60 kilometers, and a maximum value of 19,629.5 kilometers. The next variable in the specific flows data analysis is the difference between parent and host country's percent of labor force with skilled jobs squared. The variable has 5459 observations, with mean value of 2.8 percent squared, a minimum value basically equal to zero, and a maximum value of 20.62. The final variables being analyzed in the specific pair flows dataset are the unique relationship variables: regional trade agreement, common language, and colonial relationship. The variables are all dummy variables taking a value of 1 if the parent and the host countries do indeed have that relationship. The mean values of the variables are as follows: regional trade agreement (.0427), common

language (.1203), and colonial relationship (.04816). Detailed summary statistics and the correlation matrix for the variables from the specific pair flows dataset are shown in Figures 7 and 8 below.

**Figure 7. Specific Pair Flows Descriptive Statistics**

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
<b>FDI Position</b>	9167	1492.306	11155.17	-1695.2	330897
<b>Parent Real GDP</b>	8393	0.9016711	2.116566	0.00019	11.97837
<b>Host Real GDP</b>	8476	0.8404734	1.900878	0.00019	11.97837
<b>Distance</b>	8701	7456.351	4618.768	59.61723	19629.5
<b>Skill Difference Squared</b>	5459	0.0287566	0.0353393	1.03E-09	0.206284
<b>Regional Trade Agreement</b>	9167	0.0427621	0.2023313	0	1
<b>Common Language</b>	8701	0.120331	0.3253669	0	1
<b>Colony Relationship</b>	8701	0.0481554	0.2141068	0	1

**Figure 8. Specific Pair Flows Correlation Matrix**

	<b>FDI Position</b>	<b>Parent RGDP</b>	<b>Host RGDP</b>	<b>Distance</b>	<b>Labor Diff.</b>	<b>RTA</b>	<b>Common Language</b>	<b>Colony</b>
<b>FDI Position</b>	1							
<b>Parent RGDP</b>	0.2305	1						
<b>Host RGDP</b>	0.1985	-0.0076	1					
<b>Distance</b>	-0.0949	-0.0083	-0.0084	1				
<b>Labor Diff.</b>	-0.083	0.0062	0.0064	0.0621	1			
<b>RTA</b>	0.0416	0.0266	0.0265	-0.1765	0.0067	1		
<b>Common Language</b>	0.157	0.0101	0.01	-0.02	0.039	0.0733	1	
<b>Colony</b>	0.1243	0.0758	0.0756	-0.0534	0.0145	0.0477	0.1634	1



## Chapter 4

### Empirical Analysis and Results

#### *Fixed Effects Panel Analysis*

The initial data analysis is done using a fixed effects panel model to analyze the aggregate flows dataset. The main reason for using a fixed effects panel model is to control for differences across countries and years. The dependent variable in the initial fixed effect regressions is *FDI inflows*. The initial regression includes only the market potential variables as independent variables, and is given by the following equation.

#### **Baseline Fixed Effects Model**

$$FDI\ inflows_{it} = \beta_1 Market\ Potential_{it-1} + \varphi_i + \tau_t + \mu_{it}$$

In this model *Market Potential* is a vector containing the variables real GDP, population, and GDP growth rate. Notice that the independent variables are all lagged, meaning they are all from the previous year. This allows for a better discussion of causality since investors will have had time to react to events that occurred last period. The signs on all of the *Market Potential* coefficients are expected to be positive and significant since larger and growing markets are expected to be more attractive for investors. The  $\varphi_i$  symbol is a vector representing country specific fixed effects, and the  $\tau_t$  symbol is a vector representing year specific fixed effects.

The sign on the real GDP variable is positive and significant at 0.1% confidence level. The beta value is .026 meaning a one dollar increase in real GDP this period results in a 2.6 cent increase in FDI flows next period. This finding is consistent with

market seeking theory and previous findings from Davidson (1980), Blonigen (2007), and Sethi et al (2003). The sign on the population coefficient is positive, while the GDP growth rate coefficient is negative, but neither is significant at a high level. These two findings are different from the positive and significant signs theory and the previously discussed market potential research papers would predict. FDI should be driven to countries with larger populations and higher growth rates with all else being held equal. The adjusted R squared of the model is .46, which is fairly high given the limited explanatory variables. The main findings are listed in the basic panel regression results table labeled Figure 9, and the exact findings generated from the statistical package Stata can be found under table 1 in the appendix.

Next, the political and economic stability variables are added to the fixed effects model. The previously included *Market Potential* vector and fixed effects vectors are left in the model. The new model is given by the following equation.

#### **Adding Stability Measures to the Baseline model**

$$FDI\ inflows_{it} = \beta_1 Market\ Potential_{it-1} + \beta_2 Stability_{it-1} + \varphi_i + \tau_t + \mu_{it}$$

The *Stability* term in the model represents a vector containing the following variables: successful coup, attempted coup, plotted coup, and rumored coup, exchange rate volatility, and inflation rate. Just like the market potential variables, the *Stability* variables are all lagged to give investors time to react. The predicted signs on all of the *Market Potential* variables are positive since large and growing markets are expected to entice investors, and the signs on the *Stability* variables are expected to be negative since instances of instability are expected scare investors away. The positive sign and high significance remains on the real GDP variable, and both the population and GDP

growth rate coefficients are now positive similar to previously discussed research findings, but neither is significant at a high level. The signs on the political stability coefficients are mixed with the successful coup and planned coup coefficients having negative signs, and the attempted coup and rumored coup coefficients having positive signs. A joint F test of the variables rejects the null hypothesis that all of the coefficients are zero. The only variable with a significant coefficient is the attempted coup variable at the one percent confidence level. All of the signs were anticipated to be negative, but the positive sign on the attempted coup variable needs to be explored further. Additional steps taken to examine the positive sign on the attempted coup variable coefficient are explained in the next paragraph. The sign on the exchange rate volatility coefficient is positive, and the sign on the inflation rate variable is negative, but neither is significant at a high level. These findings are contrary to the negative impact of instability found by Busse and Hefeker (2007), but consistent with the mixed impact of stability results found by Sethi et al (2003).

#### *Additional Political Stability Analysis*

One possible explanation for the positive and significant coefficient on the attempted coup variable is that foreign investors regained confidence in the domestic government after they witnessed the government maintain power in the presence of an attempted coup, which lead to a higher level of investment. To further examine the impact an attempted coup this year has on FDI inflows next year, the instability terms are all removed and replaced with dummy variables recording whether or not a country experienced at least one of the specific type of unstable event last year (one for yes and zero for no). When just the political stability dummy variables are included, the signs on

the successful dummy and plotted dummy are negative like the count stability variables, with the plotted coup variable nearly being significant at the ten percent level. The sign on the attempted coup dummy variable is also positive and significant at the one percent level like it was in the count setting, suggesting that the regained confidence hypothesis still holds. The rumored coup dummy variable was omitted by the statistical package Stata because of perfect collinearity with the other independent variables. The market seeking and economic stability variables coefficients maintain the same sign and significance as in the count setting. The results of the stability dummy variable models are included in the appendix under table two. Next, the count and dummy political stability are included in the same model. Again, the signs and significance levels remain the same on the market potential and economic stability variables. The sign on the successful coup count variable is negative (not significant), and the successful coup dummy variable is omitted by the statistical package Stata due to collinearity with the other independent variables. The signs on the attempted coup count and dummy variables are both positive, but neither is significant. The exact results can be found in the appendix under table three. To further examine the attempted coup variable the dummy of attempted coup is adjusted to take a value of one if the count is greater than one. This regression yields a positive and significant sign on the count variable but a negative sign on the dummy variable. These results can be found in the appendix under table four. This finding reinforces the idea that investors regained confidence after just one coup, but multiple attempts appear to keep investors scared. Overall the stability findings are mixed, not as significant as theory would predict, and different from what previous studies have found, but the variables being analyzed are also different. The

negative signs on successful coups and confirmed plotted coups make sense since they leave investors with an increased level of uncertainty. The positive and significant sign on the attempted coup variable appears to be indicating a regained level of investor confidence in the government in place, but multiple coups in a previous year still leave investors worried. The insignificance of the economic stability variables is surprising, but may be related to little variation among countries receiving a high level of FDI inflows.

Next measures of information, infrastructure and natural resources are added to the model. The information variable is the FDI stock a country received last year. This should provide a measure of how familiar outside investors are with a particular country. The infrastructure variable is the number of internet users per one hundred people, which should provide a measure of the level of technological infrastructure in place last year. The natural resource variable is the US dollar value of a country's oil and mineral exports last year. This variable should provide a measure of a country's endowment of accessible natural resources. The expected signs of the three coefficients are positive since more information, infrastructure, and natural resources will make a region more attractive to investors. These variables are all represented by the *Information, Infrastructure & Natural Resources* vector in the regression equation listed below.

### **Adding Information, Infrastructure, & Natural Resource Measures to the model**

$$\begin{aligned}
 FDI\ inflows_{it} &= \beta_1 Market\ Potential_{it-1} + \beta_2 Stability_{it-1} \\
 &+ \beta_3 Information,\ Infrastructure\ \&\ Natural\ Resources_{it-1} + \varphi_i \\
 &+ \tau_t + \mu_{it}
 \end{aligned}$$

Notice that the market potential variables, the initial stability measures, the country specific fixed effects, and the time specific fixed effect are still included in the model. The sign on the real GDP and population coefficients remains positive, but neither is significant. The sign on the GDP growth coefficient is now positive and significant at the one percent level, and implies that an additional one percent of GDP growth in this period results in a one hundred and forty one million dollar increase in FDI inflows next period, with everything else being held constant. The political stability variables all have a negative sign, except the attempted coup, which has a positive sign and is the only significant variable, meaning that the regained confidence hypothesis is still holding. The signs on the two economic stability variables are now both negative, but neither is significant at a high level. For the most part the signs of the market potential and stability coefficients are what theory and previous studies would predict, but the level of significance is not. The sign on the internet users per one hundred people variable coefficient is actually negative and significant at the fifteen percent level. This finding is contrary to what Mollick et al (2006) found. The sign on the FDI stock variable is positive and significant at the one percent level just like the findings of Sethi et al (2003). These findings imply that countries currently receiving high levels of FDI will be more likely to attract future FDI than countries currently receiving low levels of FDI. The beta coefficient is equal to .06, meaning a one dollar increase in FDI stock this period increases FDI inflows by six cents next period. The sign on the natural resource exports variable is also positive and significant at a 0.1 percent level. This finding is exactly what it was predicted to be and is consistent with the findings of Narula (1996) and Asiedu (2006). The beta coefficient of the natural resource variable is .099, meaning a

one dollar increase in natural resource exports this period increases FDI inflows by roughly ten cents next period. The overall fit of the model remains at a similar level with an adjusted R squared value of .44. The basic results are shown below in the basic panel results table, and the detailed findings are shown in table one in the appendix.

Next the final block of variables, the trade variables, are added to the fixed effects panel model. The trade variables include manufacturing exports, manufacturing imports, service exports, and service imports. The unit used to measure all of the trade variables is US dollars. The reason the four trade measures are included is to provide a better insight on different types of trading economies. The four variables are represented by the *Trade* vector in the regression equation listed below.

#### **Adding Trade Measures to the model**

$$\begin{aligned}
 FDI\ inflows_{it} &= \beta_1 Market\ Potential_{it-1} + \beta_2 Stability_{it-1} \\
 &+ \beta_3 Information,\ Infrastructure\ \&\ Natural\ Resources_{it-1} \\
 &+ \beta_4 Trade_{it-1} + \varphi_i + \tau_t + \mu_{it}
 \end{aligned}$$

Again, all of the previously included market potential, initial stability, information, infrastructure, and natural resource variables remain in the model as well as the country and year fixed effects. The same pattern of signs and significances on the market potential variables remains, with all of the signs being positive, but only the GDP growth rate is significant at the five percent level. The signs on the political stability variables are also similar to previous regressions, with the successful coup and plotted coup being negative, and attempted and rumored coup being positive. Again the only political stability variable significant at a high level is the attempted coup variable (10% level). The two economic stability variable coefficients have negative signs, as theory would

predict, with the exchange rate volatility variable being significant at the five percent level. The information, infrastructure, and natural resource variables have the same signs and significance levels as before. The FDI stock and oil and mineral exports coefficients are positive and highly significant as theory would suggest, but the coefficient on internet users per one hundred people is negative and not significant contrary to what theory would suggest. All of the newly included trade variable coefficients are positive except service imports, which is negative, but none of the coefficients are significant. This finding does not reinforce the substitutable or the complementary relationship of FDI and international trade. The overall fit of the model remains similar with an adjusted R squared value of .4467. The basic findings can be found under Figure 9 on the next page, and the detailed findings can be found in the appendix under table one. Notice that \* represents significance at the five percent level, \*\* represents significance at the one percent level, and \*\*\* represents significance at the 0.1 percent level.



**Figure 9. Summary of Basic Fixed Effects Panel Results for FDI Inflows**

Independent Variables	Baseline	Stability Measures	Infrastructure Information & Resources	Trade Variables
Real GDP Lag	Positive***	Positive***	Positive	Positive
Population Lag	Positive	Positive	Positive	Positive
GDP Growth Rate Lag	Negative	Positive	Positive**	Positive***
Successful Coup Lag		Negative	Negative	Negative
Attempted Coup Lag		Positive**	Positive	Positive
Plotted Coup Lag		Negative	Negative	Negative
Rumored Lag		Negative	Negative	Positive
Inflation Rate Lag		Negative	Negative	Negative
Exchange Rate Vol. Lag		Positive	Negative	Negative*
FDI Stock Lag			Positive**	Positive**
Infrastructure Lag			Negative	Negative
Oil Mining Exports Lag			Positive***	Positive***
Man. Exports Lag				Positive
Man. Imports Lag				Positive
Service Exports Lag				Negative
Service Imports Lag				Positive

*Additional Analysis of Emerging Markets*

In an effort to gain a better understanding of investment flows to emerging markets a series of dummy variables reflecting a country's stage of development, based on their GDP per capita are included into the previously described fixed effects model.

Initially just the dummy variable is included in each four stages of the fixed effects panel, then the dummy variables as well as the interactions of the dummy variable with each independent variable are included in the model. The regression equation including dummy variables and dummy interactions will take the form of the following equation.

$$FDI\ inflows_{it} = \beta_1 Market\ Potential_{it-1} + \beta_2 Emerging\ Dummy + \beta_3 Emerging\ Dummy * Market\ Potential_{it-1} + \varphi_i + \tau_t + \mu_{it}$$

The first emerging market dummy variable is simply named “emerging,” and it represents countries with a real GDP per capita between 10,000 and 5,000 US dollars (1 if inside the group 0 otherwise). The next group analyzed is the “frontier” group or countries on the verge of receiving FDI inflows. This group represents countries with a real GDP per capita between 5,000 and 2,000 US dollars. The final group analyzed is the “early” group representing countries at an early stage of development with a real GDP per capita below 2,000 US dollars.

When just the emerging markets dummy variable is added to the four stages of the fixed effects panel estimation the results remain nearly identical to what they were previously. The sign of the emerging dummy variable is positive in the baseline and added stability regressions, but negative in the final two regressions, and the statistical significance of the variable is very low in all four of the regressions. The detailed results of these regressions are listed in the appendix under table five. Next, the interaction terms are included in all four stages of the regression. The market potential, stability, information, and trade vectors remain similar to what they were previously. The interesting findings come from the interaction terms, which pass a joint F test at each

stage meaning the interacted terms are jointly statistically different from zero. The interacted variable terms of emerging and population, GDP growth, attempted coup, FDI stock, and oil and mineral exports are all negative, indicating that these attributes actually reduce FDI inflows to emerging markets. The negative signs on the market seeking and stability interactions are consistent with emerging markets receiving less market seeking flows, but the negative sign on the natural resource variable is counterintuitive with the theory that emerging markets are more attractive locations for resource seeking FDI inflows. The detailed findings are included in table six in the appendix. The results are similar for the frontier dummy in the basic dummy regressions and the interaction regressions, again with all regressions passing a joint F test. The only interacted variables with significant signs are the interacted population, exchange rate volatility, oil and mineral exports, manufacturing exports, manufacturing imports, and service exports. Besides manufacturing imports, the signs on all of these variables are negative indicating an increase in any of these variables leads to decreased FDI inflows for frontier markets. The detailed results of regressions are included in the appendix under table seven and eight. Like the emerging and frontier dummy inclusion, the sign on the early coefficient is positive in the first two regressions and negative in the last two, with the only significant sign coming in the first model. The rest of variables remain similar to what they were in the initial fixed effects regressions. In the interacted regressions the only significant interacted variables were real GDP(+), population(-), exchange rate volatility(+), internet users per one hundred people(+), oil and mineral exports(-), and service exports(+). The interacted terms pass joint F tests in all four fixed effects panel

regressions. The results of the two sets of regressions are included in the appendix under tables 9 and 10.

### *FDI Per Capita Analysis*

Next the four stages of the fixed effects panel are run again, with a slight change to the left hand and right hand side of the regression equation. The new dependent variable of the four regressions is *FDI inflows per capita*, which is simply FDI inflows divided by population. The only change made to the right hand side of the regression is replacing real GDP with real GDP per capita and removing population. These changes are made to allow for a better comparison of different sized countries, and to provide a robustness check of the previous regressions. The full model including the four groups of variables is as follows.

### **FDI Inflows Per Capita Model: Including all of the Independent Variables**

$$\begin{aligned}
 & \text{FDI inflows per capita}_{it} \\
 & = \beta_1 \text{Market Potential}_{it-1} + \beta_2 \text{Stability}_{it-1} \\
 & + \beta_3 \text{Information, Infrastructure \& Natural Resources}_{it-1} \\
 & + \beta_4 \text{Trade}_{it-1} + \varphi_i + \tau_t + \mu_{it}
 \end{aligned}$$

When just the market potential variables are included in the model the real GDP per capita variable is positive and significant at the 0.1 percent level, which is consistent with the earlier regressions and previous research. The GDP growth rate is negative but significant only at the twenty per cent level. The coefficient on lagged real GDP per capita is .0786, meaning that a one dollar increase in GDP per capita this period leads to roughly an eight cent increase in FDI inflows per person next period. The overall fit of the model is quite low with an adjusted R squared value of .05. Next, the original political and economic stability variables are added to the model. The same signs and

significance levels remain on the market potential variable coefficients. All of the political stability variables are positive, except the successful coup variable, which is contrary to what theory would suggest. The only statistically significant variable is the attempted coup variable, which again appears to be supporting the regained confidence in the government in place hypothesis. The economic stability coefficients are both positive, with the exchange rate volatility variable being significant at the five percent level. This is opposite of what theory and previous research would predict. Next the information, infrastructure and natural resources variables are added to the regression equation. The sign on all of the market potential and political stability variables coefficients remains the same after the new variables are included. The only variable with a relatively high level of significance is the real GDP per capita variable ( 10% confidence level). The sign on the internet variable is positive as theory would suggest, but the sign on the FDI stock and the oil and mineral exports variables is negative which is opposite of what theory would suggest. None of the three newly included variables coefficients is significant at a high level. Finally the four trade variables are added to the regression equation. The signs on all the previously included variables remain the same, except lagged FDI stock which goes from negative to positive. Again the only significant variable is real GDP per capita at the ten percent level. The sign on the manufacturing exports and service imports coefficients is positive, and the sign on the manufacturing imports and service exports is negative, but none of the four coefficients is significant at a high level. Like the previous three regressions the overall fit of the model is quite low with an adjusted R squared of .0277. The basic results of the regressions are listed in Figure 10, and the detailed results are listed in table 11 in the appendix.

**Figure 10. Summary of Basic FDI per capita Fixed Effects Panel Results**

Independent Variables	Baseline	Stability Measures	Infrastructure Information & Resources	Trade Variables
Real GDP per capita Lag	Positive***	Positive***	Positive	Positive*
GDP Growth Rate Lag	Negative	Negative	Positive	Negative
Successful Coup Lag		Negative	Negative	Negative
Attempted Coup Lag		Positive*	Positive	Positive
Plotted Coup Lag		Positive	Positive	Negative
Rumored Lag		Positive	Positive	Positive
Inflation Rate Lag		Positive	Negative	Negative
Exchange Rate Vol. Lag		Positive	Negative	Positive
FDI Stock Lag			Negative	Negative
Infrastructure Lag			Positive	Positive
Oil Mining Exports Lag			Negative	Positive
Man. Exports Lag				Positive
Man. Imports Lag				Positive
Service Exports Lag				Positive
Service Imports Lag				Negative
Service Imports Lag				Positive

*First Differenced Model Analysis*

The next modeling technique used in the empirical analysis is a first differenced model. The main reason for estimating the first differenced model is that most of the fixed effects panel regressions have a high level of autocorrelation even when the

standard errors are clustered by country. This was tested by running regressions with the residuals as the dependent variable and the lagged residuals as the independent variable for each of the basic panel regressions. All of the regressions yielded an R squared value close to one, which signals severe autocorrelation. These results are included in the appendix under table 12. Another reason for using the first differenced model is to analyze contemporaneous changes. Like the panel analysis, the baseline first differenced model looks at only the market potential variables, which is given by the equation below.

### **Baseline Market Potential First Differenced Model**

$$\Delta FDI\ inflows_{it} = \alpha + \beta_1 \Delta Market\ Potential_{it} + \tau_i + \mu_{it}$$

The *Market Potential* term represents a vector including the variables  $\Delta real\ GDP$  and  $\Delta population$ . Notice that the first differenced model includes a vector of year fixed effects, but no vector of country specific fixed effects. Country specific fixed effects cannot be included because country specific dummy variables do not vary from year to year. The sign on the  $\Delta real\ GDP$  coefficient is positive and significant at the 0.1 percent level and the sign on the  $\Delta population$  variable is negative and significant at the one percent level. The coefficient of the  $\Delta real\ GDP$  variable is equal to .0655, indicating that a one dollar increase in real GDP leads to a 6.55 cent increase in FDI inflows. The  $\Delta population$  variable has a coefficient of -165.6, meaning a population increase of one person leads to a 165.5 dollar decrease in FDI inflows. The sign of the  $\Delta real\ GDP$  variable matches the sign theory and previous research by Davidson (1980), Blonigen et al (2007), and Sethi et al (2003) would predict since market seeking investors will be more attracted to countries experiencing economic growth. The sign on the  $\Delta population$  variable is the opposite of the anticipated one, since larger markets will

provide firms with more potential investors, but places with the fastest growing populations are not the best consumer markets. The overall fit of the model is low with an adjusted R squared value of .09. Next the natural resource variable is added to the regression, which is represented by the following equation.

### **Including Natural Resource Variables**

$$\begin{aligned} \Delta FDI \text{ inflows}_{it} \\ &= \alpha + \beta_1 \Delta \text{Market Potential}_{it} + \beta_2 \Delta \text{Oil \& Mineral Exports}_{it} + \tau_i \\ &+ \mu_{it} \end{aligned}$$

The sign on the  $\Delta \text{real GDP}$  variable remains positive and significant at the 0.1 percent level, and the sign on the  $\Delta \text{population}$  remains negative and significant, but only at the five percent level. The newly included  $\Delta \text{Oil \& Mineral Exports}$  variable is positive and significant at the 0.1 percent level, which is exactly what natural resource seeking investment theories would predict. It is also consistent with the findings from Narula (1996) and Asiedu (2006). The coefficient on the  $\Delta \text{Oil \& Mineral Exports}$  variable is .160, meaning a one dollar increase in oil and mineral exports increases FDI inflows by sixteen cents. The overall fit of the model remains low with the adjusted R squared value equaling .1095. The last addition to the first differenced model is the four differenced trade variables, which are represented by the  $\Delta \text{Trade}$  vector in the equation below.

### **Adding Trade Variables**

$$\begin{aligned} \Delta FDI \text{ inflows}_{it} \\ &= \alpha + \beta_1 \Delta \text{Market Potential}_{it} + \beta_2 \Delta \text{Oil \& Mineral Exports}_{it} \\ &+ \beta_3 \Delta \text{Trade}_{it} + \tau_i + \mu_{it} \end{aligned}$$

The sign and significance of all the previously included independent variables remains the same except the  $\Delta \text{population}$  variable, which is now only significant at the ten



percent level. The signs and significance levels of the added trade variables are as follows:  $\Delta$  *Manufacturing Exports* (negative, ten percent significance level),  $\Delta$  *Manufacturing Imports* ( positive, 0.1 percent significance level),  $\Delta$  *Service Exports* (positive, 0.1 percent significance level), and  $\Delta$  *Service Imports* (negative, five percent significance level). These findings appear to show some evidence of both market seeking and production oriented FDI flows. The positive sign on the  $\Delta$  *Manufacturing Imports* and  $\Delta$  *Service Imports* appear to be capturing investment flows finding their way to larger consumer markets. The positive sign on the  $\Delta$  *Service Exports* shows investment being attracted to service exporting countries, which may be explaining at least some of India's recent high level of investment inflows. The mixed signs do not enhance support for a complementary or substitutable relationship between FDI and trade. The overall fit of the model remains low with an adjusted R squared valued of .1560. The basic results of the three first differenced regressions can be seen in Figure 11 on the next page, and the detailed results can be seen in the appendix under table 13.

**Figure 11. Summary of First Differenced Models Results**

Independent Variables	Baseline Market Potential	Natural Resources Included	Trade Variables
$\Delta$ Real GDP	Positive***	Positive***	Positive***
$\Delta$ Population	Negative**	Negative*	Negative
$\Delta$ Oil & Mineral Exports		Positive***	Positive**
$\Delta$ Manufacturing Exports			Negative
$\Delta$ Manufacturing Imports			Positive***
$\Delta$ Service Exports			Positive***
$\Delta$ Service Imports			Negative*

*Specific Pair Flows OLS Analysis*

The last empirical analysis simply runs three ordinary least squares regressions with the specific pair flows dataset that was obtained from Bruce Blonigen at the University of Oregon. The advantage of the specific pair flows dataset is that it allows the consideration of parent country variables as determinants of FDI. The dataset provides more detailed information on where FDI is coming from, which should help shed more light on the patterns taking place. The first model estimated using the specific pair flows dataset is a basic gravity model, which regresses the parent country's FDI position in a host country on the three independent variables of parent country real GDP, host country real GDP, and distance. Remember that the FDI position variable is a measure of the total level of FDI in US dollars a parent country has in a host country in a particular year, not just the new inflows. The three independent variables are represented by the *Gravity Model* vector in the equation listed below.

### **Base line Gravity model**

$$FDI\ position = \alpha + \beta_1 Gravity\ Model + \mu$$

The coefficients on the parent country real GDP and the host country real GDP variables are positive and significant at the 0.1 percent level, and the distance variable is negative and significant at the 0.1 percent level. Based on these findings a gravity model of FDI appears to be holding. The overall fit of the model is quite low with the adjusted R squared value equaling .08. Next percent skilled labor difference squared is included in the model. This variable is included in an attempt to measure the extent of efficiency seeking FDI flows taking place. The variable is squared so positive and negative differences will be measured the same way, in an attempt to see the extent to which flows are going to countries with different skilled labor endowments. The variable is represented by the *Skilled labor Difference<sup>2</sup>* term in the equation listed below.

### **Including Skilled Labor Difference Variable**

$$FDI\ position = \alpha + \beta_1 Gravity\ Model + \beta_2 Skilled\ labor\ Difference^2 + \mu$$

Even after the skilled labor difference squared variable is added to the regression equation, all of gravity model variables maintain their signs and significance at the 0.1 percent level. The sign on the skilled labor difference squared coefficient is negative and significant at the one percent level. This finding provides no evidence of efficiency seeking flows; instead, it appears to show that market seeking FDI flows are the dominant type of FDI flows. The overall fit of the model remains low with the adjusted R squared value equaling .11. The last set of variables added to the specific pair flows regression includes the unique relationship dummy variables regional trade agreement,

common language, and colonial relationship. These variables are represented by the *Unique Relationship* vector in the regression equation listed below.

### **Adding Unique Relationship Variables**

$$FDI\ position = \alpha + \beta_1 Gravity\ Model + \beta_2 Skilled\ labor\ Difference^2 + \beta_3 Unique\ Relationship + \mu$$

After the three unique relationship variables are added the signs and significance levels of the three previously included variables remain the same. The sign on the regional trade agreement coefficient is positive and significant at the one percent level, while the signs on the common language and colonial relationship are positive and significant at the 0.1 percent level. These findings indicate the more familiar countries are with each other the more likely they are to invest in each other. Even after the introduction of the three unique relationship variables, the overall fit of the model remains low with an adjusted R squared value of .13. The basic findings are included under Figure 12 on the next page and the detailed results are included in table 14 in the appendix.

**Figure 12. Summary of Specific Pair Flows Models Results**

Independent Variables	Gravity Model of FDI	Including Labor Differences	Unique Relationship
Host Country Real GDP	Positive***	Positive***	Positive***
Parent Country Real GDP	Positive***	Positive***	Positive***
Distance	Negative***	Negative***	Negative***
% Skilled Labor Difference <sup>2</sup>		Negative**	Negative**
Regional Trade Agreement			Positive**
Common Language			Positive***
Colony Relationship			Positive***

## Chapter 5

### Discussion of Findings

#### Empirical Summary and Future Research

This research has found clear evidence of market seeking and natural resource seeking FDI flows over the time period of 1970-2010. The signs on the market seeking variables of real GDP and GDP growth, and oil and mineral exports are positive and significant in several fixed effects and first differenced regressions, which is consistent with theory and previous findings from Davidson (1980), Blonigen (2007), and Sethi et al (2003), Narula (1996) and Asiedu (2006). The positive impact of lagged FDI stock is also seen by the positive and highly significant coefficient on this variable. This finding makes sense since investors will be more likely to invest in regions that they have seen handle higher levels of FDI inflows in the past or where they already have existing investments. The impact of stability is not as clear in the fixed effects regressions. Most of the variables have their expected signs, but for the most part the coefficients are insignificant. The most interesting finding from the stability regressions is the positive and significant coefficient on the attempted coup variable. This finding appears to be indicating that investors regain confidence in the government in place after witnessing an attempted coup fail. This finding is further validated by the negative sign on the dummy variable indicating whether a country has experienced multiple attempted coups in the previous year, meaning that countries experiencing a constant state of attempted overthrows remain unattractive, while countries where the government maintains power in the midst of one attempted coup are attractive to investors since a high level of

uncertainty was avoided. There is no impact of previous infrastructure and trade on investment inflows since none of the variables are significant in a fixed effects setting. In a first differenced setting the manufacturing imports and service exports variables are positive and significant, while manufacturing exports and service imports have a negative sign. These results appear to be showing a complementary relationship between manufacturing imports, service exports, and FDI, but the link between manufacturing exports, service imports, and trade is mixed and possibly points to a substitute relationship.

The results of the specific pair flows analysis show evidence of a gravity model, with parent and country real GDP both being positive and significant while distance is negative and significant. The negative and significant coefficient on the skilled labor difference squared reinforces the prevalence of market seeking FDI flows, since flows are going from parent to host countries with similar skilled labor levels. The data does not reflect FDI flows taking place to access low or high skilled labor. The final major finding of this research is the importance of cultural proximity on FDI flows, with the regional trade agreement, common language, and colonial link coefficients all being positive and significant which matches previous findings by Dunning (1993) and Sethi et al (2003).

Continued research on FDI and its determinants, particularly investment flows to emerging markets, is critical because of the increasingly important role FDI plays in the global economy and the tremendous potential these markets provide investors and host countries. Immediate research should look to analyze the impact of other political variables as well as instability variables. Examples of political variables that should be

included in future research include measures of all types of regime changes and instances of nationalization as independent variables. Since all changes will leave investors with a greater sense of uncertainty, the inclusion of these variables will provide a greater level of variation than the instability measures used in this paper. Another extension that could be made is narrowing the scope of the research to focus on smaller subsets of time periods and subsets of regions. This will allow for a clearer image of what patterns of flows are taking place in a particular region during a particular time period rather than trying to analyze all global flows over the past forty years. Eventually research will be enhanced by more detailed time specific macro data sets, which include the timing of FDI flows, and more detailed micro level datasets, which will lead to a better understanding of FDI flows.

## **The Future of International Investment Flows**

Currently foreign direct investment flows are still recovering from the 2007 global financial crisis. The recovery has been slowed by the uncertain state of the global economy, which is mainly due to fears that the European sovereign debt crisis may lead to another large global recession. The current slowdown of the Chinese economy has also generated thoughts of uncertainty and fear in the minds of many global investors, particularly those investing in the region. If a major economic downturn does take place global FDI flows will experience another sharp decline like the one following the subprime mortgage crisis. If fears and uncertainty about the global economy remain, but a dramatic decline can be avoided flows will continue to grow at a slow rate. As more time passes, investors will become increasingly confident in the global economy, which will result in global investment flows picking up at an increasing rate. Regardless of



whether foreign direct investment experiences a sharp decline resulting from a global downturn, slow growth resulting from continued investor uncertainty, or an increased rate of recovery resulting from regained confidence in the global economy in the near future, the long run continued rise for foreign direct investment seems inevitable. The reason the rise of long run FDI flows seems inevitable is the potential benefits foreign direct investment has to offer both recipient countries and investors. Emerging markets will remain a large part of this inevitable increase because of their high rates of growth and high future potential. As emerging markets develop firms will continue their investment as well as look for the next set of emerging markets. Even though flows are expected to experience an inevitable rise there is nothing guaranteeing flows to unstable countries at an early stage of development.

## **Conclusion**

In conclusion foreign direct investment flows are extremely complicated and difficult to analyze, but continued research of FDI flows is crucial to gaining a better understanding of the global economy. Foreign direct investment is defined as large scale investments obtaining at least ten percent of voting stock. A large amount of research on foreign direct investment has been done, with early studies focusing on relative capital abundance through the use of the Heckscher-Ohlin model while recent studies have focused on specific determinants, regions, or industries. Foreign direct investment can take place in many forms, but the most common types are market seeking, resource seeking, efficiency seeking, and strategic asset seeking FDI. Even though foreign direct investors are different, there appear to be influences outside firm specific attributes shaping the landscape of where investment flows go. These influences include market

potential, stability, future expectations, information, infrastructure, operations cost structure, and natural resource abundance. The data analysis in this paper finds strong evidence of the importance of market potential, stability, information, and natural resource abundance on FDI inflows. The other suggested determinants yield mixed results. The use of more complete and detailed datasets may help clear up this problem.

Currently global FDI flows are slowly recovering from the recent global financial crisis and subsequent recession, leaving investors with a high level of uncertainty about the global economy. Prior to the recent global recession investment flows had grown at a rapid rate over the last forty years. A trend that is occurring is the rise of investment inflows to and outflows from emerging markets. In 2011, developing economies accounted for over half of global FDI inflows; their attractiveness has been driven by their high growth rates and future potential. Even though the near future of FDI appears uncertain, the long run rise of these flows appears inevitable due to the potential benefits FDI can provide host countries and investors. Foreign direct investment has the potential to provide host countries with capital, new skills, and new technologies while enhancing overall development. Investors have the potential to gain new markets, cheaper production, new sources of financing, and substantial returns. This tremendous potential will continue to drive foreign direct investment flows, which will continue to shape the world we are living in.

## Appendix

A.1. Table 1: Stability Dummy Fixed Effects Panel Regressions

	Baseline Market Model	With Stability	Adding Infras., Infor., NR	Adding Trade
Real GDP Lag	0.026*** (0.00)	0.025*** (0.00)	0.002 (0.01)	0.001 (0.02)
Population Lag	5.910 (17.69)	0.531 (11.32)	84.419 (56.52)	100.728 (65.70)
GDP Growth Rate Lag	-4337902.999 (9557218.21)	20050627.900 (15655752.04)	1.411e+08** (49999163.00)	1.253e+08* (57292442.45)
Successful Coup Lag		-6.958e+07 (3.17e+08)	-7.983e+08 (9.84e+08)	-1.132e+09 (1.16e+09)
Attempted Coup Lag		4.178e+08* (1.74e+08)	9.335e+08* (4.62e+08)	8.629e+08 (5.39e+08)
Plotted Coup Lag		-5.360e+08 (3.67e+08)	-3.735e+08 (4.72e+08)	-5.583e+08 (5.77e+08)
Rumored Coup Lag		69008349.133 (3.05e+08)	-2.339e+07 (4.38e+08)	-9.145e+07 (5.51e+08)
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-3.022* (1.46)
Inflation Rate Lag		-46767.971 (148568.96)	-610793.809 (839530.36)	-666510.904 (1071669.81)
Internet Lag			-5.785e+07 (39998114.20)	-5.150e+07 (38307834.96)
FDI Stock Lag			0.063** (0.02)	0.062** (0.02)
Oil & Mining Exports Lag			0.100*** (0.02)	0.133*** (0.03)
Man. Exports Lag				2.612e+09 (5.12e+09)
Man. Imports Lag				0.027 (0.03)
Service Exports Lag				0.170 (0.18)
Service Imports Lag				-0.303 (0.22)
Constant	-2.352e+09*** (6.68e+08)	-2.779e+11 (2.99e+11)	8.504e+11 (1.19e+12)	8.706e+14* (4.20e+14)
observations	6069.00	4798.00	2207.00	2060.00
R-squared	0.47	0.46	0.44	0.45
AIC	294018.34	233100.93	107964.98	100862.89

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.2. Table 2: Stability Dummy Fixed Effects Panel Regressions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026 <sup>***</sup> (0.00)	0.025 <sup>***</sup> (0.00)	0.002 (0.01)	0.001 (0.02)
Population Lag	5.910 (17.69)	0.537 (11.32)	84.474 (56.52)	100.753 (65.68)
GDP Growth Lag	-4337902.9 (9557218.2)	20150208.6 (15626642)	1.415e+08 <sup>**</sup> (50097869)	1.254e+08 <sup>*</sup> (57325035)
Successful Dummy Lag		-7.500e+07 (3.18e+08)	-8.325e+08 (9.86e+08)	-1.129e+09 (1.15e+09)
Attempted Dummy Lag		5.243e+08 <sup>*</sup> (2.38e+08)	1.120e+09 (6.03e+08)	1.024e+09 (6.85e+08)
Plotted Dummy Lag		-6.201e+08 (4.00e+08)	-5.880e+08 (5.64e+08)	-6.372e+08 (6.53e+08)
Rumored Dummy Lag		.	.	.
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-3.043 <sup>*</sup> (1.46)
Inflation Rate Lag		-45970.963 (148416.53)	-613951.15 (840657.22)	-668976.61 (1072877.4)
Internet Lag			-5.758e+07 (39920745.65)	-5.132e+07 (38225926.12)
FDI Stock Lag			0.063 <sup>**</sup> (0.02)	0.062 <sup>**</sup> (0.02)
Oil & Mining Exports Lag			0.100 <sup>***</sup> (0.02)	0.133 <sup>***</sup> (0.03)
Man Exports Lag				2.620e+09 (5.12e+09)
Man Imports Lag				0.027 (0.03)
Serv. Exports Lag				0.170 (0.18)
Serv. Imports Lag				-0.302 (0.22)
Constant	-2.352e+09 <sup>***</sup> (6.68e+08)	-2.749e+11 (2.97e+11)	8.541e+11 (1.19e+12)	8.769e+14 <sup>*</sup> (4.21e+14)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.44	0.45
AIC	294018.34	233098.90	107961.06	100856.95

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.3. Table 3: Stability Count & Dummy Fixed Effects Panel Regressions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026*** (0.00)	0.025*** (0.00)	0.002 (0.01)	0.001 (0.02)
Population Lag	5.910 (17.69)	0.530 (11.32)	84.351 (56.51)	100.710 (65.72)
GDP Growth Rate Lag	-4337902.99 (9557218.2)	20228416.76 (15651876)	1.416e+08** (50214485)	1.253e+08* (57373540)
Successful Lag		-7.106e+07 (3.17e+08)	-7.872e+08 (9.82e+08)	-1.106e+09 (1.17e+09)
Successful Dummy Lag		.	.	.
Attempted Lag		2.157e+08 (2.83e+08)	1.009e+09 (7.62e+08)	8.878e+08 (9.55e+08)
Attempted Dummy Lag		2.738e+08 (4.29e+08)	-1.148e+08 (9.65e+08)	-4.111e+07 (1.17e+09)
Plotted Lag		1.085e+09 (1.13e+09)	1.719e+09 (1.48e+09)	3.892e+08 (1.57e+09)
Plotted Dummy Lag		-1.745e+09 (1.29e+09)	-2.471e+09 (1.90e+09)	-1.037e+09 (1.98e+09)
Rumored Lag		74968314. (3.05e+08)	7937474.67 (4.31e+08)	-8.418e+07 (5.50e+08)
Rumored Dummy Lag		.	.	.
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-3.018* (1.46)
Inflation Rate Lag		-45306.544 (148389.68)	-608720.023 (839832.85)	-666067.916 (1072402.14)
Internet Lag			-5.790e+07 (40029848)	-5.152e+07 (38336965)
FDI Stock Lag			0.063** (0.02)	0.062** (0.02)

Oil & Mining Exports Lag			0.100 <sup>***</sup> (0.02)	0.133 <sup>***</sup> (0.03)
Manufacturing Exports Lag				2.609e+09 (5.12e+09)
Manufacturing Imports Lag				0.027 (0.03)
Service Exports Lag				0.170 (0.18)
Service Imports Lag				-0.303 (0.22)
Constant	-2.352e+09 <sup>**</sup> (6.68e+08)	-2.810e+11 (2.99e+11)	8.458e+11 (1.19e+12)	8.697e+14 <sup>*</sup> (4.21e+14)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.44	0.45
AIC	294018.34	233104.85	107968.90	100862.88

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.4. Table 4: Stability Count & Dummy for Multiple Unstable Events Fixed Effects Panel Regressions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026*** (0.00)	0.025*** (0.00)	0.002 (0.01)	0.001 (0.02)
Population Lag	5.910 (17.69)	0.530 (11.32)	84.385 (56.54)	100.679 (65.73)
GDP Growth Rate Lag	-4337902.99 (9557218.21)	20260882.37 (15653070.8)	1.422e+08** (50354219.3)	1.263e+08* (57512564.5)
Successful Lag		-7.136e+07 (3.17e+08)	-7.882e+08 (9.84e+08)	-1.083e+09 (1.17e+09)
Successful Dummy Lag		.	.	.
Attempted Lag		5.153e+08* (2.47e+08)	1.170e+09 (6.00e+08)	1.352e+09 (7.11e+08)
Attempted Dummy Lag		-4.621e+08 (5.51e+08)	-1.078e+09 (1.74e+09)	-2.752e+09 (2.70e+09)
Plotted Lag		1.084e+09 (1.13e+09)	1.675e+09 (1.50e+09)	3.762e+08 (1.57e+09)
Plotted Dummy Lag		-1.744e+09 (1.29e+09)	-2.413e+09 (1.91e+09)	-1.002e+09 (1.97e+09)
Rumored Lag		76852438.1 (3.06e+08)	-7918322.0 (4.31e+08)	-1.075e+08 (5.53e+08)
Rumored Dummy Lag		.	.	.
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-3.118* (1.46)
Inflation Rate Lag		-45471.966 (148353.07)	-612075.487 (841118.03)	-672277.663 (1075690.72)
Internet Lag			-5.786e+07 (40017446.9)	-5.174e+07 (38405935.2)
FDI Stock Lag			0.063** (0.02)	0.062** (0.02)

Oil & Mining Exports Lag			0.100 <sup>***</sup> (0.02)	0.133 <sup>***</sup> (0.03)
Man. Exports Lag				2.650e+09 (5.12e+09)
Man. Imports Lag				0.027 (0.03)
Service Exports Lag				0.170 (0.18)
Service Imports Lag				-0.302 (0.22)
Constant	-2.352e+09 <sup>**</sup> (6.68e+08)	-2.809e+11 (2.99e+11)	8.514e+11 (1.19e+12)	8.983e+14 <sup>*</sup> (4.21e+14)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.44	0.45
AIC	294018.34	233104.83	107966.87	100862.77

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



A.5. Table 5: Basic Fixed Effects Panel Regressions with Emerging Dummy

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026*** (0.00)	0.025*** (0.00)	0.002 (0.01)	0.001 (0.02)
Population Lag	5.828 (17.75)	0.312 (11.41)	84.917 (56.66)	100.898 (65.78)
GDP Growth Rate Lag	-4270128.83 (9515048.07)	20750639.62 (15338008.2)	1.404e+08** (49886318.9)	1.248e+08* (57254886.8)
Emerging Dummy	3.499e+08 (1.21e+09)	8.064e+08 (1.35e+09)	-5.735e+08 (8.17e+08)	-3.335e+08 (8.61e+08)
Successful Lag		-7.006e+07 (3.19e+08)	-7.928e+08 (9.84e+08)	-1.127e+09 (1.16e+09)
Attempted Lag		4.154e+08* (1.73e+08)	9.231e+08* (4.60e+08)	8.556e+08 (5.37e+08)
Plotted Lag		-5.444e+08 (3.72e+08)	-3.538e+08 (4.75e+08)	-5.465e+08 (5.80e+08)
Rumored Lag		69766381.82 (3.06e+08)	-9328025.69 (4.37e+08)	-8.364e+07 (5.52e+08)
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-2.963* (1.46)
Inflation Rate Lag		-47294.741 (149587.10)	-603557.377 (827685.54)	-661890.363 (1060402.35)
Internet Lag			-5.781e+07 (39958223.0)	-5.164e+07 (38433693.7)
FDI Stock Lag			0.063** (0.02)	0.062** (0.02)
Oil & Mining Exports Lag			0.099*** (0.02)	0.132*** (0.04)
Man. Exports Lag				2.658e+09 (5.12e+09)
Man. Imports Lag				0.027 (0.03)

Service Exports Lag				0.171 (0.18)
Service Imports Lag				-0.302 (0.22)
Constant	-2.605e+09*	-2.845e+11	8.428e+11	8.539e+14*
	(1.21e+09)	(3.05e+11)	(1.18e+12)	(4.21e+14)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.44	0.45
AIC	294020.07	233101.92	107968.80	100864.83

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.6. Table 6: Basic Fixed Effects Panel Regressions with Emerging Dummy & Interactions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.024 <sup>***</sup> (0.00)	0.023 <sup>***</sup> (0.00)	-0.005 (0.01)	-0.001 (0.01)
Population Lag	126.690 <sup>*</sup> (53.55)	142.177 <sup>**</sup> (48.04)	124.162 <sup>***</sup> (35.57)	60.703 (62.80)
GDP Growth Rate Lag	57263810.49 (40245750.)	80476268.82 (47645138.)	2.788e+08 <sup>*</sup> (1.20e+08)	1.988e+08 (1.24e+08)
Emerging Dummy	3.118e+09 <sup>***</sup> (9.13e+08)	4.382e+09 <sup>***</sup> (1.09e+09)	23947717.39 (1.17e+09)	3.885e+08 (1.25e+09)
Emer. Real GDP Lag	0.011 <sup>**</sup> (0.00)	0.010 <sup>**</sup> (0.00)	0.028 (0.01)	0.005 (0.02)
Emer. Population Lag	-144.767 <sup>**</sup> (51.86)	-159.212 <sup>***</sup> (46.83)	-113.686 <sup>**</sup> (33.95)	-61.903 (58.53)
Emer. Real GDP Growth Lag	-7.252e+07 (42578317)	-8.452e+07 (52862552.)	-2.214e+08 (1.24e+08)	-1.413e+08 (1.34e+08)
Successful Lag		5.666e+08 (8.18e+08)	-8.890e+08 (1.01e+09)	-1.163e+09 (1.18e+09)
Attempted Lag		-5.212e+08 (1.19e+09)	2.676e+09 <sup>**</sup> (9.55e+08)	3.422e+09 <sup>***</sup> (9.95e+08)
Plotted Lag		-1.590e+09 (1.67e+09)	-2.773e+09 <sup>*</sup> (1.17e+09)	-2.833e+09 <sup>*</sup> (1.33e+09)
Rumored Lag		-8.550e+08 (1.59e+09)	7.303e+08 (1.79e+09)	-1.988e+08 (3.27e+09)
Ex. Rate Vol. Lag		0.001 (0.00)	-0.002 (0.00)	-1637.489 (900.34)
Inflation Rate Lag		-1415936.645 (3627900.10)	1763305.413 (2094949.87)	2525319.876 (2256211.78)
Emer. Successful Lag		-6.061e+08 (7.65e+08)	.	.
Emer. Attempted Lag		9.688e+08 (1.20e+09)	-1.844e+09 <sup>*</sup> (8.76e+08)	-2.667e+09 <sup>**</sup> (9.81e+08)
Emer. Plotted Lag		1.170e+09 (1.69e+09)	2.649e+09 <sup>*</sup> (1.26e+09)	2.500e+09 (1.42e+09)
Emer. Rumored Lag		9.831e+08 (1.60e+09)	-6.464e+08 (1.98e+09)	5.242e+08 (3.46e+09)
Emer. Ex. Rate Vol Lag.		.	.	1634.710 (900.48)

Emer. Inflation Lag	1407977.961 (3620728.53)	-2365045.75 (2218289.99)	-3138160.31 (2435312.84)
Internet Lag		-6.153e+07 (44215352.7)	-5.185e+07 (38081799.7)
FDI Stock Lag		0.072** (0.03)	0.076** (0.02)
Oil & Mineral Exports Lag		0.098*** (0.03)	0.160*** (0.05)
Emer. Internet Lag		1.066e+08 (56506780.93)	1.031e+08 (60069508.42)
Emer. FDI Stock Lag		-0.033 (0.04)	-0.052 (0.04)
Emer. Oil & Mineral Ex Lag		-0.025 (0.03)	-0.116** (0.04)
Manufacturing Exports Lag			2.404e+09 (5.48e+09)
Manufacturing Import Lag			-0.025 (0.03)
Service Exports Lag			0.312 (0.25)
Service Imports Lag			-0.438 (0.31)
Emer. Man. Exports Lag			-8.463e+09 (4.54e+09)
Emer. Man. Imports Lag			0.061 (0.03)
Emer. Service Exports Lag			-0.180 (0.29)
Emer. Service Imports Lag			0.546 (0.35)
Constant	-4.808e+09** (8.23e+08)	-3.596e+11 (2.45e+11)	8.166e+11 (1.12e+12)
observations	6069.00	4798.00	2207.00
Adjusted R-squared	0.47	0.47	0.45
AIC	293957.17	233056.10	107935.08

Standard errors in  
parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ ,  
\*\*\*  $p < 0.001$

A.7. Table 7: Basic Fixed Effects Panel Regressions with Frontier Dummy

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026*** (0.00)	0.025*** (0.00)	0.002 (0.01)	0.001 (0.01)
Population Lag	6.018 (17.78)	0.551 (11.33)	83.850 (55.63)	100.477 (65.14)
GDP Growth Rate Lag	-3776440.00 (9488639.33)	20158068.60 (15681412.8)	1.413e+08** (50316230.7)	1.259e+08* (57916579.6)
Frontier Dummy	-4.628e+08 (5.63e+08)	-1.444e+08 (6.76e+08)	6.816e+08 (1.02e+09)	8.877e+08 (1.06e+09)
Successful Lag		-7.180e+07 (3.16e+08)	-7.767e+08 (9.95e+08)	-1.101e+09 (1.18e+09)
Attempted Lag		4.141e+08* (1.75e+08)	9.641e+08* (4.64e+08)	9.058e+08 (5.32e+08)
Plotted Lag		-5.369e+08 (3.66e+08)	-3.857e+08 (4.73e+08)	-5.820e+08 (5.82e+08)
Rumored Lag		65747364.42 (3.06e+08)	-2.282e+07 (4.30e+08)	-8.382e+07 (5.41e+08)
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-3.097* (1.45)
Inflation Rate Lag		-46762.695 (148361.60)	-628485.375 (845592.62)	-691451.341 (1085103.81)
Internet Lag			-5.734e+07 (39890530.13)	-4.978e+07 (37392466.86)
FDI Stock Lag			0.063** (0.02)	0.062** (0.02)
Oil & Mining Exports Lag			0.101*** (0.02)	0.135*** (0.04)
Manufacturing Exports Lag				2.274e+09 (5.20e+09)
Manufacturing Imports Lag				0.026 (0.03)
Service Exports Lag				0.171 (0.18)
Service Imports Lag				-0.306 (0.23)
Constant	-2.264e+09** (6.82e+08)	-2.774e+11 (2.99e+11)	8.746e+11 (1.20e+12)	8.923e+14* (4.18e+14)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.44	0.45
AIC	294019.27	233102.86	107966.57	100864.26

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.8. Table 8: Basic Fixed Effects Panel Regressions with Frontier Dummy & Interactions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026 <sup>***</sup> (0.00)	0.025 <sup>***</sup> (0.00)	-0.002 (0.01)	-0.001 (0.01)
Population Lag	3.986 (15.26)	-0.509 (9.96)	71.965* (35.98)	83.553 (44.76)
GDP Growth Rate Lag	-2651465.70 (9005070.37)	16991289.08 (17781531.1)	1.601e+08** (56800613.8)	1.333e+08 (68315092.1)
Frontier Dummy	-3.571e+08 (4.64e+08)	40364190.76 (5.59e+08)	-1.081e+09 (1.03e+09)	1.408e+09 (1.13e+09)
Front. Real GDP Lag	-0.015 (0.01)	-0.016 (0.01)	0.010 (0.02)	0.005 (0.01)
Front. Population Lag	-7549504.81 (12658281.4)	5511566.512 (32466281.6)	-8.125e+07 (75696696.8)	-7.402e+07 (86505055.5)
Front. Real GDP Growth Lag	40.390 (26.33)	39.998 (29.13)	7.439 (25.33)	-70.705 <sup>***</sup> (13.95)
Successful Lag		36653725.55 (3.25e+08)	-4.801e+08 (1.07e+09)	-9.441e+08 (1.27e+09)
Attempted Lag		3.681e+08* (1.75e+08)	9.574e+08 (4.90e+08)	9.302e+08 (5.79e+08)
Plotted Lag		-5.367e+08 (3.76e+08)	-3.611e+08 (5.13e+08)	-5.616e+08 (6.47e+08)
Rumored Lag		-6.888e+07 (3.27e+08)	-3.985e+08 (4.86e+08)	-7.213e+08 (7.27e+08)
Ex. Rate Volatility Lag		0.001* (0.00)	-0.002 (0.00)	25.038* (11.31)
Inflation Rate Lag		64254.692 (62638.05)	-538275.767 (504178.67)	2658982.343 (1745901.32)
Front. Successful Lag		-7.630e+08 (7.54e+08)	-1.918e+09 (2.06e+09)	-2.295e+09 (2.21e+09)
Front. Attempted Lag		7.741e+08 (5.53e+08)	-6.085e+08 (1.49e+09)	6.036e+08 (1.95e+09)
Front. Plotted Lag		-5.994e+07 (1.29e+09)	5.670e+08 (1.59e+09)	5.553e+08 (1.67e+09)
Front. Rumored Lag		1.242e+09 (8.32e+08)	2.527e+09 (1.80e+09)	2.054e+09 (2.11e+09)
Front. Ex. Rate Vol Lag.		-3.731** (1.36)	-3.431 <sup>***</sup> (0.86)	-29.209* (11.69)
Front. Inflation Lag		-1040736.97 (1115851.41)	-177538.498 (1296310.69)	-3078432.29 (1853714.91)
Internet Lag			-6.993e+07 (45702848.2)	-5.116e+07 (39404209.1)

FDI Stock Lag			0.069** (0.02)	0.072** (0.02)
Oil & Mineral Exports Lag			0.109*** (0.02)	0.145** (0.05)
Front. Internet Lag			96200097.71 (54854400.5)	81007010.05 (54136170.9)
Front. FDI Stock Lag			-0.021 (0.03)	-0.047 (0.04)
Front. Oil & Mineral Ex Lag			-0.090* (0.03)	-0.122* (0.05)
Manufacturing Exports Lag				2.289e+09 (5.01e+09)
Manufacturing Imports Lag				-0.009 (0.03)
Service Exports Lag				0.264 (0.22)
Service Imports Lag				-0.393 (0.28)
Front. Man Exports Lag				-1.289e+10 (6.67e+09)
Front. Man Imports Lag				0.287*** (0.08)
Front. Service Exports Lag				-0.707* (0.28)
Front. Service Imports Lag				0.328 (0.36)
Constant	-2.232e+09** (6.67e+08)	-4.649e+11* (1.81e+11)	7.854e+11 (7.12e+11)	-7.214e+15* (3.26e+15)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.45	0.46
AIC	294014.02	233111.03	107965.10	100843.39

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.9. Table 9: Basic Fixed Effects Panel Regressions with Early Dummy

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.026 <sup>***</sup> (0.00)	0.025 <sup>***</sup> (0.00)	0.002 (0.01)	0.001 (0.01)
Population Lag	5.905 (17.94)	0.400 (11.49)	84.513 (54.97)	101.489 (65.10)
GDP Growth Rate Lag	-2760256.49 (9039107.00)	21624823.38 (15195373.1)	1.386e+08 <sup>**</sup> (48949378.0)	1.235e+08 <sup>*</sup> (56478533.0)
Early Dummy	1.121e+09 <sup>*</sup> (5.55e+08)	9.764e+08 (6.41e+08)	-2.976e+09 (2.55e+09)	-3.352e+09 (2.94e+09)
Successful Lag		-8.517e+07 (3.16e+08)	-6.749e+08 (1.04e+09)	-9.603e+08 (1.25e+09)
Attempted Lag		3.898e+08 <sup>*</sup> (1.69e+08)	1.013e+09 <sup>*</sup> (4.53e+08)	9.510e+08 (5.05e+08)
Plotted Lag		-5.523e+08 (3.70e+08)	-3.244e+08 (4.71e+08)	-5.297e+08 (5.76e+08)
Rumored Lag		47873066.17 (3.06e+08)	52078707.25 (4.11e+08)	15911317.48 (5.22e+08)
Ex. Rate Vol. Lag		0.000 (0.00)	-0.002 (0.00)	-2.721 (1.56)
Inflation Rate Lag		-47370.129 (148728.37)	-650482.593 (839931.86)	-714246.557 (1078901.10)
Internet Lag			-5.540e+07 (39126435.2)	-4.639e+07 (35513187.8)
FDI Stock Lag			0.064 <sup>**</sup> (0.02)	0.063 <sup>**</sup> (0.02)
Oil & Mining Exports Lag			0.101 <sup>***</sup> (0.02)	0.135 <sup>***</sup> (0.04)
Manufacturing Exports Lag				1.795e+09 (5.28e+09)
Manufacturing Imports Lag				0.026 (.03)
Service Exports Lag				0.176 (0.18)
Service Imports Lag				-0.310 (0.23)
Constant	-2.951e+09 <sup>**</sup> (8.12e+08)	-2.819e+11 (3.00e+11)	9.165e+11 (1.19e+12)	7.840e+14 (4.51e+14)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.44	0.45
AIC	294016.87	233101.23	107964.30	100859.96

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



A.10. Table 10: Basic Fixed Effects Panel Regressions with Early Dummy &amp; Interactions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP Lag	0.025 <sup>***</sup> (0.00)	0.025 <sup>***</sup> (0.00)	-0.003 (0.01)	0.000 (0.01)
Population Lag	-5.215 (12.27)	-2.846 (10.85)	48.843 (26.87)	0.424 (55.34)
GDP Growth Rate Lag	11503403.15 (19440224)	54806571.85 (29138426.)	1.887e+08* (74677290.)	1.449e+08 (75286215.)
Early Dummy	1.612e+09** (4.93e+08)	1.623e+09** (5.71e+08)	1.410e+08 (8.27e+08)	-3.588e+08 (1.23e+09)
Early. Real GDP Lag	0.019 <sup>***</sup> (0.00)	0.016 <sup>***</sup> (0.00)	0.026 (0.01)	0.021 (0.02)
Early. Population Lag	-26.458 <sup>***</sup> (5.35)	-23.784 <sup>***</sup> (5.55)	-51.651* (23.34)	-65.523* (30.98)
Early. Real GDP Growth Lag	-2.168e+07 (21520525.5)	-6.789e+07 (35121942.)	-1.251e+08 (77544351.)	-9.078e+07 (90722853.)
Successful Lag		-2.966e+08 (6.36e+08)	-2.248e+09 (1.83e+09)	-9.936e+08 (3.08e+09)
Attempted Lag		4.333e+08 (6.32e+08)	1.132e+09 (1.09e+09)	2.281e+09 (1.39e+09)
Plotted Lag		-1.202e+09 (1.00e+09)	-5.997e+08 (1.13e+09)	-4.774e+08 (1.25e+09)
Rumored Lag		1.980e+08 (8.82e+08)	9.651e+08 (1.10e+09)	3.038e+08 (1.59e+09)
Ex. Rate Vol. Lag		-3.714** (1.35)	-3.983** (1.31)	-4.372** (1.42)
Inflation Rate Lag		-886104.540 (1123212.87)	-576433.220 (1113832.89)	-827156.526 (1311322.35)
Early. Successful Lag		2.053e+08 (6.58e+08)	1.691e+09 (1.75e+09)	-4.589e+07 (3.13e+09)
Early. Attempted Lag		-9.950e+07 (6.32e+08)	-2.619e+08 (1.07e+09)	-1.498e+09 (1.38e+09)
Early. Plotted Lag		7.694e+08 (1.05e+09)	4.630e+08 (1.26e+09)	2.202e+08 (1.42e+09)
Early. Rumored Lag		-2.242e+08 (9.19e+08)	-1.457e+09 (1.32e+09)	-7.602e+08 (1.90e+09)
Early. Ex. Rate Vol Lag.		3.715** (1.35)	3.981** (1.31)	23.221* (10.08)
Early. Inflation Lag		933719.732 (1121812.09)	-335548.577 (1145462.62)	34586897.879 (19681536.04)

Internet Lag			-5.776e+07 (42463611.0)	-5.100e+07 (37214906.81)
FDI Stock Lag			0.070** (0.02)	0.074** (0.02)
Oil & Mineral Exports Lag			0.101*** (0.02)	0.156*** (0.04)
Early. Internet Lag			1.620e+08* (64062276.3)	1.956e+08** (71253557.43)
Early. FDI Stock Lag			-0.015 (0.05)	-0.082 (0.05)
Early. Oil & Mineral Ex Lag			-0.001 (0.06)	-0.164*** (0.04)
Manufacturing Exports Lag				1.851e+09 (5.56e+09)
Manufacturing Import Lag				-0.018 (0.03)
Service Exports Lag				0.247 (0.23)
Service Imports Lag				-0.361 (0.27)
Early. Man Exports Lag				-3.929e+09 (5.21e+09)
Early. Man Imports Lag				0.004 (0.06)
Early. Service Exports Lag				-0.187 (0.21)
Early. Service Imports Lag				0.792*** (0.23)
Constant	-2.778e+09** (7.29e+08)	-4.578e+11* (1.76e+11)	1.248e+12* (4.88e+11)	-5.431e+15 (2.84e+15)
observations	6069.00	4798.00	2207.00	2060.00
Adjusted R-squared	0.47	0.46	0.45	0.47
AIC	293984.08	233096.40	107956.13	100838.77

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ ,

\*\*\*  $p < 0.001$

A.11. Table 11: FDI per capita Fixed Effects Panel Regressions

	Baseline Market Model	With Stability	Infra, Infor, NR	Adding Trade
Real GDP per capita Lag	0.079 <sup>***</sup> (0.02)	0.094 <sup>***</sup> (0.02)	0.128 (0.08)	0.158 <sup>*</sup> (0.07)
GDP Growth Rate Lag	-1.365 (1.07)	-0.750 (2.02)	6.000 (6.65)	-0.042 (7.94)
Successful Lag		-3.277 (26.95)	-63.834 (102.27)	-49.083 (124.39)
Attempted Lag		35.357 <sup>*</sup> (15.26)	23.871 (28.34)	20.529 (39.92)
Plotted Lag		5.995 (31.61)	21.064 (64.09)	-6.706 (86.69)
Rumored Lag		27.788 (41.26)	162.414 (158.23)	120.220 (143.97)
Ex. Rate Vol. Lag		0.000 <sup>*</sup> (0.00)	-0.000 (0.00)	0.000 (0.00)
Inflation Rate Lag		0.008 (0.00)	-0.010 (0.04)	-0.026 (0.05)
Internet Lag			6.292 (6.62)	4.646 (5.26)
FDI Stock Lag			-0.000 (0.00)	-0.000 (0.00)
Oil & Mining Exports Lag			-0.000 (0.00)	0.000 (0.00)
Manufacturing Exports Lag				700.795 (1101.52)
Manufacturing Imports Lag				0.000 (0.00)
Service Exports Lag				0.000 (0.00)
Service Imports Lag				-0.000 (0.00)
Constant	-372.663 <sup>**</sup> (111.63)	-29801.837 <sup>*</sup> (12204.22)	4458.317 (49414.40)	-1.390e+07 (71248535.10)
observations	6070.00	4799.00	2207.00	2060.00
Adjusted R-squared	0.05	0.05	0.03	0.03
AIC	106071.46	84753.13	40596.49	38022.66

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.12. Table 12: Autocorrelation Test of Basic Panel Regressions

	Baseline Market Model	With Stability	Adding Infra, Infor, NR	Adding Trade
reg1yhatlag	1.023 <sup>***</sup> (0.00)			
reg2yhatlag		1.000 <sup>***</sup> (0.00)		
reg3yhatlag			1.000 <sup>***</sup> (0.00)	
reg4yhatlag				1.000 <sup>***</sup> (0.00)
Constant	1.398e+08 <sup>***</sup> (16657070.9)	2.380e+08 <sup>***</sup> (23284579.9)	4.631e+08 <sup>***</sup> (92338233.8)	5.153e+08 <sup>***</sup> (1.00e+08)
observations	6116.00	4691.00	1957.00	1818.00
R-squared	1.00	1.00	1.00	1.00
AIC	273985.54	212119.08	92174.50	85784.71

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.13. Table 13: First Differenced Model Regressions

	Baseline Market Model	Adding Natural Resources	Adding Trade Variables
D. Real GDP	0.066 <sup>***</sup> (0.00)	0.069 <sup>***</sup> (0.00)	0.031 <sup>***</sup> (0.01)
D. Population	-165.600 <sup>**</sup> (56.33)	-198.100 <sup>*</sup> (82.29)	-147.763 (87.89)
D. Oil Mining Exports		0.160 <sup>***</sup> (0.03)	0.094 <sup>**</sup> (0.03)
D. Manu Exports			-0.027 (0.02)
D. Manu Imports			0.189 <sup>***</sup> (0.02)
D. Service Exports			0.337 <sup>***</sup> (0.09)
D. Service Imports			-0.309 <sup>*</sup> (0.12)
Constant	-1.897e+08 (6.20e+08)	74326453.1 (9.62e+08)	1.325e+08 (1.36e+09)
observations	6776.00	3669.00	3201.00
Adjusted R-squared	0.0750	0.0949	0.1458
AIC	.	.	.

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A.14. Table 14: Specific Flows OLS Estimation

	Gravity Model	Adding Labor Differences	Adding Unique Pair Variables
Parent Real GDP	1174.722*** (61.58)	1701.487*** (90.49)	1592.968*** (90.69)
Host Real GDP	1135.422*** (68.40)	1609.730*** (98.09)	1502.138*** (98.07)
Distance	-0.292*** (0.03)	-0.342*** (0.04)	-0.345*** (0.04)
Skill Difference <sup>2</sup>		-14584.08** (5513.84)	-14619.30** (5462.38)
RTA			803.090 (767.33)
Common Language			4380.872*** (715.73)
Colony Relationship			5768.927*** (1025.02)
Constant	1818.665*** (258.56)	2320.433*** (376.52)	1858.326*** (391.51)
observations	7702.00	5093.00	5093.00
Adjusted R-squared	0.08	0.11	0.13
AIC	166050.43	111496.20	111402.27

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

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