# DETERMINANTS OF FDI FROM TRADITIONAL VERSUS NONTRADITIONAL SOURCE COUNTRIES

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## Abstract

Inflows of foreign direct investment spur growth in the receiving country and cause positive spillovers of technology and skill throughout the entire economy. FDI comes from source countries that can be broadly classified as traditional and nontraditional investors. Traditional refers to wealthy and developed economies, while nontraditional refers to emerging economies in the process of developing. The overarching hypothesis is that nontraditional source countries are less risk-averse than their wealthier counterparts. This is believed to be the case because multinational enterprises located in these regions are familiar with political and economic uncertainties at home; therefore, less than satisfactory investment conditions in the host economy abroad do not deter their interest. If FDI is originating in a more diverse set of source countries, does this mean receiving nations have more opportunities to attract FDI and subsequently experience positive growth? We test how the two source country types respond to different elements of risk using a random effects generalized least squares regression. Our main empirical findings support that political instability indeed does not deter FDI flows originating in nontraditional source countries, however quality of transport and trade-related infrastructure within the receiving economy does determine FDI flows from both source country types. Overall, we strongly emphasize that a blanket generalization concerning investment behavior between different types of source countries cannot be made, and encourage more research to be done in this relatively new field of study.

KEYWORDS: (FDI flows, source-host country pairs, traditional and nontraditional sources, location choices)

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# CHAPTER I

# INTRODUCTION

The phenomenon of foreign direct investment [FDI] has been rooted in the study of industrialization and globalization for the past century. It is examined from both macroeconomic and microeconomic perspectives. The microeconomic branch of FDI pertains to industrial organization and firm behavior, and the macroeconomic level examines motivations for capital flows between country pairs. These flows are measured by the Balance of Payments Statistics (Lipsey, 2001). FDI is broadly defined by the OECD Benchmark Definition of Foreign Direct Investment (2008) as "a category of cross-border investment made by a resident in one economy with the objective of establishing a lasting interest in an enterprise that is resident in an economy other than that of the direct investor… the 'lasting interest' is evidenced when the direct investor owns at least 10% of the voting power in the direct investment enterprise" (p. 17). It is different from portfolio investment, in which the investor generally has little influence on management of the foreign enterprise.

There are two types of FDI: horizontal, or "market-seeking" FDI, and vertical, also known as "efficiency-seeking" or "resource-seeking" FDI. Horizontal FDI occurs when firms seek to exploit potential new markets. In this case, the firm identically duplicates their activities in the source country at the same value chain stage abroad in order to "access markets in the face of trade frictions" (Blonigen, 2005, p. 393). Vertical

FDI is driven by "access to low wages as part of the production process" (p. 393) and/or access to raw materials.

Another more recent type of vertical FDI travels "upward" as opposed to downward, stemming from the emergence of developing economies as sources of FDI. This has been named "asset-augmenting FDI", and occurs when enterprises originating in relatively poorer countries locate in richer, more advanced countries in order to acquire superior technology (Andrés et al., 2012). The type of FDI believed to spur the most job creation and growth is greenfield investment, which consists of starting new ventures from the ground up, therefore excluding mergers and acquisitions [M&As] and other equity investments (Amighini & Franco, 2012).

A large body of literature is devoted to examining the relationship between foreign direct investment and economic growth in the receiving, or host country. Countries want to attract FDI due to evidence of positive effects on economic growth. Li and Liu (2005) call FDI "a composite bundle of capital stock, know-how, and technology," which can "augment the existing stock of knowledge in the recipient economy through labor training, skill acquisition and diffusion, and the introduction of alternative management practices and organizational arrangement" (p. 393). While theory points to FDI as a cause of growth, and not vice versa, the empirical evidence shows that from the mid-1980s onward "FDI and economic growth become significantly complementary to each other and form an increasingly endogenous relationship" (Li & Liu, 2005, p. 404). The data shows that the relationship is circular: FDI may have a positive impact on growth in the receiving country, which leads to an enlarged market size, which leads to further FDI and enhanced competitiveness (Li & Liu, 2005).

The objective of attracting FDI, especially for emerging countries, is that it enables the diversification of markets, provides higher-paying jobs to the domestic population, and allows ties to be formed between domestic and transnational firms. Ultimately, this allows receiving countries of FDI to play a larger role in the globalized world economy (Nelson, 2005). The impact of FDI on growth seems to be inversely related to the technological gap between leaders and followers (de Mello, Jr., 1999). Economies lagging behind in terms of development reap the greatest benefits from FDI, although the majority of FDI occurs between technologically advanced economies.

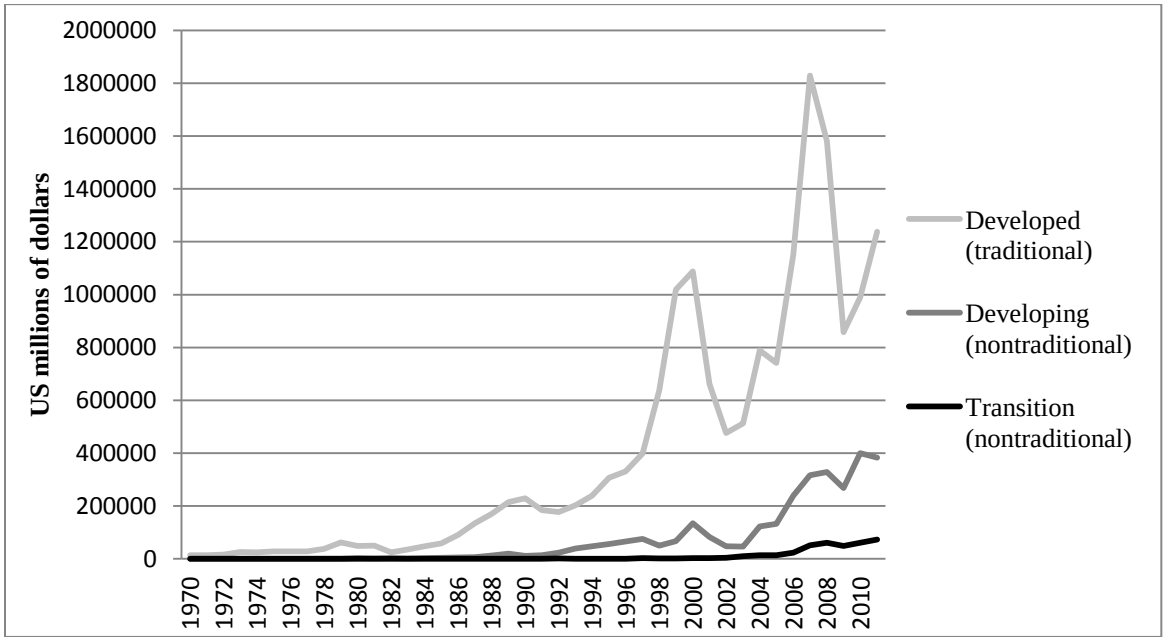
The positive effects of FDI are bound to certain conditions. In order for it to promote economic growth, a foundation of human capital and the ability to absorb technology are necessary (Li & Liu, 2005). Country–specific factors such as the quality of institutions, trade regime, and level of political risk can affect the success of transfers of technology and knowledge (de Mello, Jr., 1999). Furthermore, success stories are dependent on economies relatively open to trade and with lower financial restrictions (Basu et al., 2003).

Although FDI theory supports the notion of positive linkages between FDI and growth, there is some contention within the empirical literature as to whether FDI actually causes advantageous spillovers in the host economy. The effects likely vary across sector types. The main concern is for the primary sector, due to the fact that natural resources can be removed from the country without even a hint of residual effects on the local economy (Alfaro, L., 2003). As stated by Chowdhury & Mavrotas (2006) on the ambiguous evidence concerning the assumption that FDI causes growth: “Increased attention needs also to be given to the overall role of growth (and the quality of growth)

as a crucial determinant of FDI along with the quality of human capital, infrastructure, institutions, governance, legal framework, ICT[1] and tax systems in host countries" (p. 18). The process of trying to create the optimal investment environment by making positive changes within a host country will in of itself be beneficial to growth, regardless of whether the FDI itself causes significant positive spillovers.

FIGURE 1.1

FDI OUTFLOWS BY SOURCE COUNTRY SIZE, 1970-2011




Source: Calculations based on data from UNCTAD Stat.

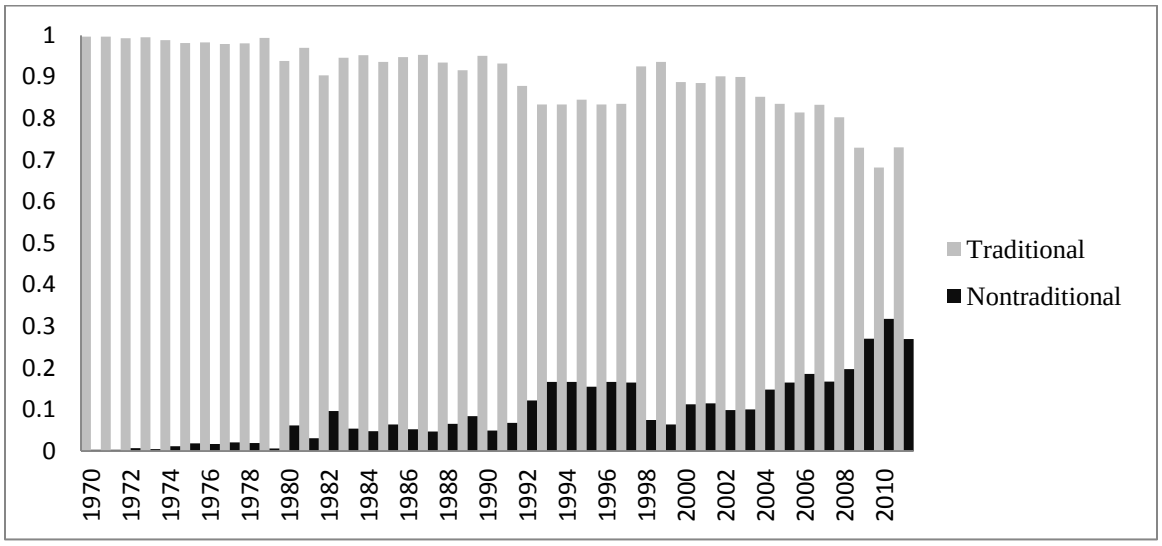
Wealthy countries are considered to be the traditional sources of FDI. For many decades, Europe, the United States, and Japan have been the largest contributing sources of outward FDI. However, in the 1990s, developing Asia, considered a nontraditional source of FDI due to relatively low per capita income and shorter history of FDI, surpassed Japan in terms of FDI outflows (Lipsey, 2001).

[1] ICT stands for information and communication technologies.

The trend of considerable amounts of FDI outflows originating in developing and transition economies appeared long before Asia made its debut in the 1990s (see Figure 1.1). In the late 1970s and early 1980s, a new "wave" of multinational enterprises [MNEs] originating in nontraditional source countries emerged. According to Andrés et al. (2012), the significance and size of their contribution has increased in recent years, with more than 28 percent of overall FDI outflows originating in these economies in the years 2009-2010 (see Figure 1.2). This translates to a more competitive environment for established MNEs, as well as the possibility of "more options available to lure FDI from different sources" for host countries.

FIGURE 1.2

PERCENT OF WORLD FDI OUTFLOWS BY SOURCE COUNTRY TYPE, 1970-2011




Source: Calculations based on data from UNCTAD Stat.

Most scholarly works agree that inflows of FDI provide positive benefits for the receiving country, which leads us to examine and pinpoint domestic determinants of FDI flows from different source types. Many governments manage investment promotion agencies (Andrés et al., 2012), which exist to attract and provide incentives for foreign

firms to bring their "own 'package' of skills, experience, technology, management, and marketing experience" to the host economy (Wilkins, 1970, pp. 613-614). Largely unsettled within the literature are the major variables pertaining to the host country that either deter or encourage a foreign firm to take the risk and invest.

This paper aims to further highlight the systematic differences in determinants of FDI from traditional and nontraditional investors. Are their pull-factors, and factors of deterrence, the same? If these two different types of direct investors behave differently, it could mean new opportunities for emerging countries "that are not among the most favorite outbound destinations ever, due to their often difficult business, economic and political environment" (Amighini & Franco, 2012, p. 2) to attract FDI. Consequently, we improve upon the knowledge of how a nation should prioritize internal improvements in order to increase FDI inflows, and which type of investor they should target. Currently, the literature regarding investment behavior from different source country types is sparse, so we hope to contribute to this field in which no consensus on the impact of different host country conditions on FDI flows has been reached.

The dependent variable in our analysis is the natural logarithm of FDI flows in US dollars between country pairs from 2006 to 2011, and associations are found using a generalized least squares random effects regression applied to two data subsets: one in which the source countries are traditional and the other in which they are nontraditional. A total of 13 hypotheses, mostly stemming from the research done by Andrés et al. (2012), and two of which are unique to this study are tested to draw conclusions concerning behavioral differences between traditional and nontraditional source countries when making choices about location and volume of FDI.

Our empirical results indicate that the most obvious way for host countries to attract larger FDI flows from both types of investors is to prioritize the improvement of trade and transport-related infrastructure, as it is strongly correlated with larger FDI flows. This is contrary to results reached by Amighini and Franco (2012), who suggested that national agglomeration is the most important factor in determining flows from nontraditional source countries.

As predicted in this study, cultural ties are correlated with larger flows from both traditional and nontraditional source countries, in line with findings by Andrés et al. (2012). Larger market size is important to the former, and political instability does not seem to impact FDI flows from the latter. Further distance between the source and host country seems to equally discourage both investors. This contradicts results from Andrés et al. (2012), who found that nontraditional investors are as risk averse as traditional investors and that nontraditional investors are much more sensitive to distance.

We propose two hypotheses that have not yet been tested in the literature. One proposes that higher levels of national security in the host country positively affect FDI flows, and the other hypothesizes that greater similarity in physical geography between the country pair positively impacts FDI. Our results for the first support that a large military presence within the host country seems to deter investment from traditional source countries, however higher levels of military spending seems to spur larger flows from nontraditional source countries. Regarding the second hypothesis, the results are ambiguous.

A lingering question in our study and the work done by Amighini and Franco (2012) and Andrés et al. (2012), is determining what type of FDI is most popular among the two types of investors. All three studies found ambiguous evidence as to whether horizontal FDI or vertical FDI play a larger role in the investment portfolio of traditional and nontraditional investors.

# CHAPTER II

# THEORETICAL BACKGROUND

The earliest form of FDI theory stems from the eclectic OLI paradigm of international production, developed by John H. Dunning in the 1950s. He hypothesized that if a domestic firm has superior productivity compared to a firm located abroad, then the same firm operating in the foreign country should at least be as productive as the parent company and in turn outperform the local firm. The explanation given for why a firm might be more productive is due to what he calls "ownership-specific" advantages.

If the intangible assets of the parent company cannot be replicated abroad, then those traits are non-transferable and are thus characterized as "location-specific." From this, productivity differentials between firms are explained by location "L" and ownership-advantages "O". The "I" portion of the OLI paradigm stands for internationalization. "I" is meant to capture how it is more profitable for some firms operating abroad to internalize their assets instead of selling these or their rights through the open market (Dunning, 2008).

Hymer (1976) extends the theory of "L" with his concept of "liability of foreignness." He postulates that firms face disadvantages when operating abroad compared to local firms, because they are plagued with cost externalities that come with an unknown marketplace and culture. More recent FDI theory proposes that while this may be true, emerging market MNEs may have an advantage over traditional investors

when investing in developing economies, due to their "adversity advantage." They are familiar with and adapted to uncertainty at home, thus apply knowledge of what kinds of modifications are useful to their firms abroad in foreign marketplaces lacking "both the 'hard' and 'soft' infrastructures" (Ramamurti, 2008, p. 13). This leads us to the following hypotheses:

H1. Greater levels of infrastructure within the host country positively affect FDI flows. However, the effect is stronger for traditional source countries.

H2. It is believed that FDI is more likely to occur between countries that share cultural similarities, such as having an official national language in common, because they ease the burden of operating in a foreign marketplace. This effect should be stronger for nontraditional source countries due to their relative newness as sources of FDI outflows.

After observing the increase in FDI originating in less developed countries, including an increase in the number of less productive firms abroad, Moon and Roehl (2001) amended the "O" proposed by Dunning. Instead of applying the theory of ownership-specific advantages, they introduced the theory of imbalance. The imbalance theory postulates that less productive firms invest abroad in order "to access the resources necessary to redress the imbalance" within their firms, and build up their assets (p. 198). The following hypothesis addresses this theory:

H3. Asset-seeking FDI is likely to have limited importance if the nontraditional source country is incapable of absorbing the superior technology and knowledge.

There are two explanations for vertical FDI. Typically, the difference in income per capita of the source and host country explains why rich countries invest vertically downward into poorer countries- they are taking advantage of the lower resource and labor costs. However, there is also the occurrence of MNEs located in poorer countries investing upward in more advanced and wealthier countries, pursuing asset-augmenting FDI. These MNEs are trying to take advantage of the superior business organization and technology of the receiving country.

A gravity model approach is traditionally applied to trade theory. The theoretical model is that at some origin $i$ there exists a supply of goods, labor, or other factors, $Y_i$, that are attracted to a mass of demand for goods or labor, $E_j$, at destination $j$. The flow between the two masses is restricted by distance between the source and destination, "$d_{ij}$" (Anderson, 2010). The model specifies that trade flows between countries are primarily a function of the distance between the two countries and the GDP of each country (Blonigen, 2005). From this general concept of how distance affects FDI flows, we build the following hypothesis:

H4. Distance between the source and receiving economy should be a stronger deterrent for nontraditional investors than traditional investors. This is based on the assumption that MNEs in emerging countries have competitive advantages mainly in neighboring economies of similar economic vitality.

The explanatory variables used in empirical research to test for host country conditions that have the largest impact on FDI flows from source countries consist of both conventional and avant-garde determinants of FDI. FDI flows have traditionally

been explained by market-related determinants, such as size and growth of host country markets (Nunnenkamp, 2002). According to Chakrabarti (2001), market size, as measured by the host country GDP per capita, is the single most widely accepted determinant of FDI flows. This stems from the hypothesis that a large market is necessary for the efficient utilization of resources and exploitation of economies of scale. He finds a significant positive impact of host country GDP per capita on FDI. Given the above recommendations, we make the following hypotheses:

H5. MNEs from emerging countries tend to locate in places where their local purchasing power is relatively small, therefore the size of the host country market should have a lesser impact on nontraditional investment. This hypothesis "may hold as long as horizontal FDI from new sources is concentrated in smaller host economies with relatively low per-capita income. On the other hand, FDI from nontraditional sources may focus on host countries offering larger market potential and higher economic growth" (Andrés et al., 2012).

H6. Resource-seeking FDI has been shown to be of less importance to nontraditional than traditional firms. As wages tend to be higher in traditional source countries, vertical FDI should be of more importance to traditional investors.

H7. Nontraditional and traditional investors may both be drawn to a country due to access to raw materials. However, this should likely play a fairly small role in the location choices of nontraditional investors.

In the age of globalization, countries have privatized firms, removed trade restrictions, and liberalized FDI, which has lead to an increase in the relative importance of "cost differences between locations, the quality of infrastructure, the ease of doing business and the availability of skills" (World Investment Report, 2006, p. 96). This is particularly relevant to emerging markets.

Previous literature has tested the validity of the hypothesis that political risk, business conditions, and macroeconomic variables matter. According to Jun and Singh (1995), "although many aggregate econometric studies have been conducted, a broad consensus on the major determinants of FDI has been elusive" (pp. 4-5). After testing macroeconomic and sociopolitical determinants, they conclude that export orientation, as measured by the relative size of the export sector in the host economy and a reflection of openness to trade, is the single most important determinant of FDI flows. Chakrabarti (2001) similarly reports a strong effect of openness to trade on FDI, as measured by trade volume as a percent of GDP. Nunnenkamp (2002) finds that openness to trade is positively correlated to FDI in the manufacturing sector only. Despite variations in findings, all authors encourage countries to adopt and promote an open trade policy environment. The previous literature leads us to the following three hypotheses:

H8. MNEs based in emerging countries are more accustomed and adjusted to political and economic instability at home, therefore are less deterred by unstable conditions abroad than traditional investors.

H9. A host country that has fewer trade restrictions is more likely to attract FDI than one that hinders trade. Openness to trade is likely of equal importance to traditional and nontraditional investors.

H10. The difficulties and inefficiencies of doing business in a host country will deter traditional investors more than nontraditional investors. There may be no correlation between doing business and FDI flows from nontraditional source countries due to their "adversity-advantage."

Due to the prevalence of nontraditional variables in recent literature, Nunnenkamp (2002) conducted a study that gave strong evidence for the conjecture that traditional market-related determinants still dominate the explanation of the geographic distribution of FDI: "Nontraditional determinants such as cost factors, complementary factors of production and openness to trade typically reveal the expected correlation with FDI. However, the importance of nontraditional determinants has increased at best modestly so far." His empirical research shows that the bias of FDI in favor of host countries with large market-sizes has become stronger, not weaker. He does however find that among unconventional determinants, the availability of local skills in the host economy has become a relevant pull factor, which strengthens the case for human capital formation. He concludes that "efforts to provide better education and training would not only enhance economic growth effects of FDI in developing countries, but also likely induce higher FDI inflows" (pp. 35 – 36). Therefore, we test the following hypothesis:

H11. Human capital formation is positively correlated with FDI flows. However, the effect is stronger for traditional source countries.

Within the literature of the past decade, unconventional determinants (meaning they are not specifically related to host country markets or distance between country pairs) are examined, such as the level of corruption in the host country. Corruption is expected to negatively impact FDI flows due to the external costs it creates (Al-Sadig, 2009). The effects of institutional quality in the host country on FDI inflows are also examined (Al-Sadig, 2009; Benassy-Quere et al., 2005). One study maintains that a country with sound institutions can attract up to 29 percent more per capita FDI inflows than a country with poor institutions, all else held constant (Al-Sadig, 2009). The quality of some institutions in the host country has a sizeable impact on inward FDI, "which provides an optimistic image as the independent improvement of institutions attracts FDI and is therefore likely to provide a basis for growth and development" (Benassy-Quere et al., 2005, p. 11) within the receiving countries.

Very few studies address the systematic differences in determinants between FDI flows from traditional and nontraditional sources. According to Jun and Singh (1995), "there are no simple models or strong theoretical foundations to guide an empirical analysis" of the influence of macroeconomic and sociopolitical determinants on the geographic distribution of FDI flows, therefore the results of past studies should be "employed as an imperfect, but useful guide" (p. 4). Therefore, variables in the previous literature found to be of importance to FDI flows are tested for both types of investors in this study.

Eleven of our 13 hypotheses stem from previous literature. The hypotheses proposed by Andrés et al. (2012) are used as a guideline for the majority of our own

hypotheses. We additionally formulate two new hypotheses that have heretofore been unexamined:

H12. We propose that larger volumes of FDI are more likely to occur in countries that share similar geographical features and climates.

By extending the concept of cultural "distance" between countries, we formulate the idea of physical geography "distance". The investment abroad is often a replica of all or some of the operations in the host country. If the firm's industry and operations are correlated to the physical geography and climate of the home country, they would likely be dependent on those same conditions abroad in order to operate efficiently. An additional explanation is that the investor is adjusted to and comfortable with the environment at home, thus may consciously or subconsciously seek a similar physical environment abroad. An alternative hypothesis would be that firms locate in places that are more dissimilar, in order to diversify their assets.

H13. Higher levels of national security within the host should reinforce investor confidence and positively impact FDI flows. The effect is expected to be larger for traditional sources of FDI.

The last hypothesis comes from the same line of thought as to how greater levels of political stability positively affect FDI. Conflict and disturbances hinder the efficiency of conducting business, and would therefore deter investors.

No literature exists related to H12 and H13. The variables measuring national security are likely to be closely tied with the explanatory variables measuring political stability. The variables measuring physical geography are likely correlated with the variable measuring resource depletion. Because we assume they are correlated with FDI flows, and even if insignificant in the model, it is important to include them as controls in order to avoid potential omitted variable bias.

# CHAPTER III

## EMPIRICAL MODEL & DATA

Values of FDI flows between country pairs from 2006 to 2011 used in the empirical analysis of this paper were compiled from the public data provided by the Organization for Economic Cooperation and Development [OECD][2], and also the limited public data provided by the United Nations Conference on Trade and Development [UNCTAD][3]. The remaining data was compiled from the World Bank database, specifically Worldwide Governance Indicators[4], Worldwide Development Indicators[5] and Doing Business[6]. Obviously, reporting rates vary depending on the source and receiving country. Data related to time-invariant variables such as country pair cultural similarities and physical distance comes from the CEPII Gravity Database, affiliated with the French research center of international economics Centre d'Analyse Stratégique.

The majority of previous research has acknowledged hindrance to analysis caused by the lack of thorough data. We do what the majority of previous literature has glossed over, and that is to provide richness in detail by looking at country-pair specific variables and flows, instead of solely examining aggregate inflows from all source countries. Furthermore, little to no literature exists before 2012 examining the systematic differences in determinants between traditional and nontraditional source country types.

[2] Collected from 1960 to 2011.
[3] Collection years vary depending on the source country.
[4] Collected in 1996, 1998, 2000, and 2002 to 2011.
[5] Collected from 1960 to 2011.
[6] Collected from 2006 to 2012.

We have emulated the few studies which have studied this topic, making our results comparable.

The driving classification behind the usefulness of this analysis is defining what it means to be a traditional or nontraditional source country. The World Bank and OECD have their own classifications of emerging and transition economies. For the purpose of this paper, a nontraditional source is classified as a country in the process of developing or a country that has recently emerged from its period of transition to a free market economy. Although countries previously part of the Eastern Bloc joined the EU in 2004 and are no longer classified as in transition, virtually no FDI outflows originated in these countries before 1995. Their FDI outflows reflect "current investment decisions and their drivers rather than the inertia of past decisions" (Brada, 2011, p. 109), as is the case with traditional source countries. For these reasons, the Czech Republic, Estonia, Hungary, Poland, the Slovak Republic and Slovenia are classified as nontraditional. The nontraditional source country with the highest GDP per capita in the dataset is South Korea, and the lowest earning traditional source country is Spain.

Twenty-seven variables in total are tested for their association with FDI flows from traditional and nontraditional investors, some of which are dyadic and others that pertain only to the receiving country in the country-pair. For detailed definitions of each variable, see Appendix A, and for descriptive statistics, see Appendix B. Many variables found to be of statistical importance in previous literature are removed from the analysis due to limited data[7]; however, quality substitutes are incorporated to capture the same

[7] Amighini & Franco (2012) use the percent of all manufacturing exports that are high-tech to reflect the asset-augmenting FDI sometimes pursued by nontraditional MNEs (p. 9). Instead, we use *R_research*, which accounts for research and development expenditure as a percent of GDP in the host country. Other variables were removed due to theoretical similarity to other variables used in the

relationships. The results outlined in the following chapter are interpreted as capturing associations and not causal effects, due to possibility of endogeneity between the dependent and explanatory variables. The reduced form equation estimated in this paper is given by:

$$y_{srt}^{s} = \beta_0 + X'\Gamma + M'\Delta + P'\Theta + I'\Lambda + K'\Xi + T'\Pi + V'\Sigma + B'\Phi + C'\chi + G'\Psi + N'\Omega + \propto_{sr} + \varepsilon_{ijt}$$

$$s = T, N \tag{3.1}$$

The dependent variable is the natural logarithm of FDI flows from source country $s$ to receiving country $r$ in year $t$. The superscript $s$ relates that this equation is used twice, once for the traditional source country subset, when $s = T$, and once for the nontraditional source country subset, when $s = N$. Variables $X, M, P, I, K, T, V, B, C, G, N$ are vectors containing anywhere from one to five variables. $\beta_0$ is the constant term, $\propto_{sr}$ is the time-invariant error term, and $\varepsilon_{srt}$ is the time-variant error term.

The variables are grouped into the following broader categories in the empirical model. $X$ = {*R_inflation*}, which measures the economic stability within the receiving country. $M$ = {*R_agglomeration, R_diffGDPpercap, R_lnGDPpercap*}, and captures macroeconomic conditions within the receiving country. $P$ = {*R_voice, R_polistable, R_corruption*}, meant to measure political stability within the host country. $I$ = {*R_sanitation, R_infrastructure*}, and is meant to reflect the level of infrastructure in the receiving country. $K$ = {*R_education*}, and aims to capture the amount of human capital formation in the receiving country. $T$ = {*R_hosttrade*}, and aims to measure the host

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regressions, such as *R_polconIII*. It was originally incorporated from The Political Constraint Index Dataset "POLCON" produced by Witold J. Henisz, as done in Andrés et al. (2012), however was ultimately removed from the regression due to its theoretical similarity to *R_polistable*, which has higher rates of reporting.

country's openness to trade. $V$ = {*R_research, R_resourcedepletion*} are meant to reflect conditions within the host country that may motivate vertical FDI. $B$ = {*R_startbusiness, R_constructionprocedures, R_legalrights, R_investorprotection*} reflects the ease of doing business in the receiving country. $C$ = {*P_contiguous, P_commonlanguage, P_colony*} captures how similar the country pair is culturally. $G$ = {*P_distance, P_area, P_forest, P_elevation, P_rain*}, and aims at not only measuring distance between the country pair, but also how similar the country pair is from a physical geography and climate perspective. $N$ = {*R_armysize, R_militaryspending*}, and aims to capture the level of national security within the receiving country.

The data subsets provide insight and evidence for conclusions made concerning the thirteen hypotheses. H8, which relates to how political and economic instability affect FDI flows, is addressed by $X$ and $P$. Inflation serves as a proxy for measuring economic stability, as high levels of inflation typically reflect poor financial institutions. The three variables concerning political stability are incorporated from the World Bank Worldwide Governance indicators, and account for the perceived level of how effective and how democratic the governmental institutions are in the host country.

H5, which concerns the importance of market size to the two types of investors, is addressed by $M$. The variable *R_agglomeration* is a measure of gross fixed capital formation in the private sector. Previous literature has agreed upon the concept that FDI outflows follow where FDI has already proven to be successful. The traditional measure of market size, which is the GDP per capita in the receiving country, is also used to test this hypothesis. Furthermore, relative purchasing power is reflected using a variable that calculates the difference in GDP per capita between source and receiving countries. If the

value of *R_diffGDPpercap* is positive, the source country is wealthier per capita than the receiving country, and if negative, it is poorer. Values near zero indicate that the two economies are very similar.

H1 examines how varying levels of infrastructure affect direct investors. This is addressed using $I$. Two separate measures for infrastructure are used. One specifically relates to the quality of trade-related infrastructure, such as the usefulness of the road system within the receiving country. The variable measuring sanitation within the host country is meant to reflect the quality of infrastructure in general.

Human capital formation in H11 is measured using $K$. The assumption is that a more educated population leads to a more productive work force. $T$ is used to test H9. The variable measures trade volume as a percent of GDP, and higher numbers reflect an economy that is relatively more open to trade. The variables reflecting motives for pursuing the two types of vertical FDI in $V$ are used to test H3, H6, and H7.

The validity of H10, regarding how the ease of conducting business in the host country affects the foreign investor, is tested using $B$. Although the variables themselves pertain to experiences had by domestic firms, the quality of their experiences serves as a proxy for the experience of the international investor.

The gravity model used to explain FDI flows only use the distance between the source and host country as an explanation for the geographical distribution of FDI, as seen in H4. One of the variables in $G$ allows this to be tested. The other variables within the vector allow an investigation to be made of H12. Physical geographical similarities are measured using the four remaining variables. *P_area* compares how similar the countries are in size, *P_forest* measures similarities in percent of land area that is

forested, *P_elevation* compares the percent of land area that is below five meters in altitude, and *P_rain* measures the difference in rainfall between the two countries. The absolute value is taken of all the differences, thus for each of these variables, values closer to zero indicate that the country pair is more similar and those further from zero indicate more physical differences between the pair. $C$, regarding cultural similarities, is used to test the validity of H2.

Lastly, $N$ is used to examine H13. The two variables in $N$ are meant to serve as a representation of national security in the host country. High percentages of armed personnel may suggest good security, or it might reflect inter- or intra- country conflict.

TABLE 3.1

EXPECTED SIGNS ON COEFFICIENTS GIVEN HYPOTHESES

| | VARIABLES | $s = T$ | $s = N$ | magnitude |
|---|---|---|---|---|
| *X* | *R_inflation* | – | – or NC | T > N |
| *M* | *R_agglomeration* | + | + | ? [8] |
| | *P_diffGDPpercap* | + | + | T > N |
| | *R_lnGDPpercap* | + | ? [9] | |
| *P* | *R_voice* | + | + or NC | T > N |
| | *R_polistable* | – | – or NC | T > N |
| | *R_corruption* | – | – or NC | T > N |
| *I* | *R_sanitation* | + | + | T > N |
| | *R_infrastructure* | + | + or NC | T > N |
| *K* | *R_education* | + | + | T > N |

[8] Amighini & Franco (2012) claim that the positive influence of agglomeration economies (FDI follows where it has already proven to be successful) is the most relevant factor that affects FDI flows of nontraditional "South" MNEs to other nontraditional countries (p. 12). There is no variable measuring FDI stock in the host country; however, *R_agglomeration* serves as a proxy. There is no hypothesis as to which correlation is stronger, because it matters to both.

[9] Andrés et al. (2012) states that emerging countries tend to locate their FDI flows in places where their local purchasing power is relatively small (see H5). Instances FDI from nontraditional source countries aimed to be asset-augmenting, meaning locating in relatively wealthier countries, may offset the effect.

| | VARIABLES (cont.) | $s = T$ | $s = N$ | magnitude |
|---|---|---|---|---|
| $T$ | *R_hosttrade* | + | + | T > N |
| $V$ | *R_research* | ? [10] | + | T < N |
| | *R_resourcedepletion* | + | + | T > N |
| $B$ | *R_startbusiness* | – | – or NC | T > N |
| | *R_constructionprocedures* | – | – or NC | T > N |
| | *R_legalrights* | + | + or NC | T > N |
| | *R_investorprotection* | + | + or NC | T > N |
| $C$ | *P_contiguous* | + | + | T < N |
| | *P_commonlanuage* | + | + | T < N |
| | *P_colony* | + | + | T < N |
| $G$ | *P_distance* | – | – | T < N |
| | *P_area* | – | – | T < N |
| | *P_forest* | – | – | T < N |
| | *P_elevation* | – | – | T < N |
| | *P_rain* | – | – | T < N |
| $N$ | *R_armysize* | ? | ? or NC | |
| | *R_militaryspending* | ? | ? or NC | |
| NC = no correlation ? = unknown / ambiguous | | | | |

The estimates from Equation 3.1 allow us to provide insight on each of the hypotheses. See Table 3.1 for predicted directions of each of the variable coefficients, in addition to which magnitude of the two data subsets is expected to be greater if the signs are the same. Discussion of the results from the two regressions is located in Chapter IV.

[10] Traditional sources pursuing horizontal FDI locate in other wealthy countries, which likely invest many resources into research and development, meaning the coefficient is expected to be positive. However, vertical FDI locating in relatively poorer countries with little R&D may offset the effect.

## Estimation Methodology

A generalized least squares (GLS) random effects regression is used to assess the data, using robust standard errors. The data itself is separated into two subsets, one in which the FDI flows stem from traditional source countries, and the other in with the FDI flows originate in nontraditional source countries. The data subsets are regressed separately, in order to compare and contrast the marginal effects of the determinants on the two types of investors. The panel spans the years 2006 to 2011. The data set includes 54 source countries, of which 32 are classified as nontraditional, and 213 receiving countries (see Appendices F, G & H for details).

A random effects model was chosen over a fixed effects model, despite the prevalence of the latter in the literature. In a fixed effects model, time-invariant variables drop out of the analysis (Wooldridge, 2009). Eight of the 27 explanatory variables incorporated in the regression are time-invariant, thus it would be counterintuitive to use a fixed effects model. The Hausman test (see Appendix D) further verifies that a random effects model is preferable over a fixed effects model for the nontraditional source country data subset (Torres-Reyna, 2009). Although the Hausman test for the traditional source country data subset indicates that a fixed effects model is preferable, the random effects GLS regression was a better fit[11].

The dependent variable in the regressions is the natural logarithm of FDI outflows in US dollars, which is the same method used by Andrés et al. (2012). Note that the use of a natural logarithm drops all negative values, which may bias the results. However,

[11] R-squared value using random effects = 0.4866; R-squared value using fixed effects = 0.1535.

only 13.26% of all FDI values in the data are negative[12]. Robust standard errors were estimated, correcting for heteroskedasticity, and the GLS model itself corrects for serial correlation which is inherent in a random effects model due to time-invariant error (Wooldridge, 2009).

[12] Two sensitivity analyses check the validity of the results (Appendix E). In the first, the difference is that the dependent variable is FDI flows in US dollars, which includes negative values. In the second, the dependent variable is the natural logarithm of FDI flows, and all negative values are replaced with zero instead of being dropped. A random effects tobit regression was used. The signs of coefficients for all statistically significant variables remained the same through all three analyses, except for *R_hosttrade* in the first of these two regressions, which was found to have a negative coefficient at a 1% level of significance for the traditional country subset. It is also worth noting that *P_colony* in the tobit regression of the nontraditional country subset has a positive coefficient at the 11% level of significance, and in the GLS regression the coefficient does not near the conventional benchmark of significance.

# CHAPTER IV

## RESULTS & DISCUSSION

An initial overview of the results from the GSL regressions of the traditional and nontraditional source country data subsets (see Table 4.1) makes it readily apparent that more factors come into play when traditional sources are making investment decisions. Sixteen of 27 total variables are statistically significant at the 10% level or higher concerning FDI outflows from traditional source countries, while only eight are of statistical importance for outflows from nontraditional source countries. Our initial conclusion is that nontraditional investors are deterred by fewer factors than their traditional counterparts when making investment decisions. This could translate to more opportunities for developing and lower-income countries to attract investment.

The empirical research done by Andrés et al. (2012) gave evidence to support the idea that nontraditional direct investors are as risk-averse to political uncertainty as traditional investors. In contrast, our initial findings support H8, that nontraditional investors are less deterred or undeterred by political instability. The coefficients on *R_voice* and *R_politstable* are both statistically significant at the 1% level using the traditional country data subset. As expected, the former is positively correlated with FDI flows and the latter is negatively correlated with FDI flows. Neither variable is found to be correlated with FDI flows in the nontraditional country subset. Despite the contradiction, Andrés et al. (2012) make a valid point: "it would be self-defeating if host

TABLE 4.1

Panel data random effects GLS regression, robust, 2006-2011[13]

| | VARIABLES | $s = T$ | $s = N$ |
|---|---|---|---|
| *X* | *R_inflation* | .0060 | .0145 |
| *M* | *R_agglomeration* | **.0606*** ** | -.0308 |
| | *P_diffGDPpercap* | 5.84e-06 | -.00002 |
| | *R_lnGDPpercap* | **.5438** ** | .1774 |
| *P* | *R_voice* | **.7269*** ** | **-.1479** |
| | *R_polistable* | **-.7682*** ** | **.0817** |
| | *R_corruption* | .0973 | ***-.8584*** |
| *I* | *R_sanitation* | -.0001 | -.0035 |
| | *R_infrastructure* | **1.6491*** ** | ***1.2089**** |
| *K* | *R_education* | .0024 | .0490 |
| *T* | *R_hosttrade* | -.0010 | .0041 |
| *V* | *R_research* | *-.4881*** | -.0367 |
| | *R_resourcedepletion* | *-.0307** | *-.0069** |
| *B* | *R_startbusiness* | *.0089** | **-.0054** |
| | *R_constructionprocedures* | .0081 | **.0237** |
| | *R_legalrights* | -.0741 | **.1286** |
| | *R_investorprotection* | .0996 | **-.0495** |
| *C* | *P_contiguous* | **1.0587*** ** | **2.4413*** ** |
| | *P_commonlanguage* | **1.0371*** ** | **5.0589*** ** |
| | *P_colony* | **1.3735*** ** | -.1618 |
| *G* | *P_distance* | **-.0001*** ** | **-.0001** ** |
| | *P_area* | *2.26e-07**** | 3.54e-08 |
| | *P_forest* | -.0007 | **-.0347*** ** |
| | *P_elevation* | *.0129**** | *.0403**** |
| | *P_rain* | **-.0003** ** | -.0005 |
| *N* | *R_armysize* | *-.4058*** | -.1561 |
| | *R_militaryspending* | .1854 | *.5556** |
| Note ***, **, and * denote significance at the one, five, and ten percent level, respectively. | | $R^2$ = 0.4866<br>Prob > $Chi^2$ = 0.0000<br># of obs = 1072 | $R^2$ = 0.3976<br>Prob > $Chi^2$ = 0.0000<br># of obs = 453 |

[13] If the sign of the coefficient is as expected, it is bolded. If the sign or magnitude is different than hypothesized or is in need of further investigation, it is italicized.

countries gave less priority to macroeconomic stabilization and containing political uncertainty by institutional reforms and better governance." Nonetheless, they concede that future research might reveal that investors familiar with unstable conditions at home may respond differently to elements of risk than traditional investors. Further research with more detail of risk pertaining to political stability would be helpful to resolve the contradiction.

Surprisingly, *R_corruption*, which accounts for factors such as the prevalence of bribery of public officials, is not correlated with smaller FDI flows from traditional source countries. Rather, it almost reaches the benchmark level of statistical significance for the nontraditional source country subset at 10.9%, and is negatively correlated with FDI flows. The negative correlation begins to challenge our initial conclusion that nontraditional investors are less deterred by unstable and unsavory conditions abroad.

The variable measuring economic stability, *R_inflation*, is not found to be significant for either data subset. Inflation is significant and negatively impacts the likelihood of FDI from traditional source countries in the research done by Andrés et al. (2012), and was also negatively correlated with the number of investment projects from nontraditional sources in the study done by Amighini & Franco (2012). Ultimately, we believe there is compelling evidence to support H8 regarding political stability, but inconclusive evidence supporting the assumption that economic instability affects FDI flows. The corruption variable needs to be further investigated.

Although poor governance may not impact FDI flows from nontraditional investors, it appears that they do take into account hard infrastructure in the receiving

country when making investment decisions. This leads us to reconsider H1. The variable *R_infrastructure*, an index concerning trade and transport-related infrastructure in the host economy, is found to be significant and positively correlated with FDI outflows from both types of investors, and the evidence does not appear to impact traditional investors more. *R_sanitation*, also meant to reflect the level of hard infrastructure within the economy, is not significant for either data subset.

To further test the overarching concept that nontraditional investors are less averse to all elements of risk, we look at the business environment within the host economy. We find generally weak evidence in support of H10. Of the four factors used to account for doing business in the host economy, only one is found to be significant and positive at the 10% level for the traditional country subset, and none are significant for the nontraditional source country subset. Our results show that the average time to establish a business is actually correlated with larger FDI flows, which is counterintuitive to the assumption that traditional investors are concerned about efficiency. Perhaps it reflects the notion that traditional source countries, due to decades of investment practice, are experienced in overcoming the inefficiencies of emerging host economies. It would be interesting to investigate this alternative hypothesis.

The most important of these "Doing Business" variables, according to previous literature and theory, is *R_investorprotection*. Although it does not measure protection specific to foreign investors, the quality of treatment of domestic investors can likely be extended and imply how foreign investors are treated. This variable is almost statistically significant for the traditional country subset, and is positively correlated with FDI flows.

None of these variables related to "Doing Business" are statistically significant for the nontraditional country subset, as expected.

One of the most important aspects of business conditions in the receiving country is how open the economy is to trade. Much of the previous literature emphasizes the importance of fewer trade restrictions on FDI. A unique variable used by Andrés et al. (2012) is replicated here, *R_hosttrade*, which reflect an economies openness to trade, and is likely a function of the presence of bilateral trade agreements. The variable is not found to be statistically significant concerning FDI from either type of source country, leading us to find no evidence in support of H9. This contradicts findings by Andrés et al. (2012), who found that trade agreements were effective in inducing higher FDI flows from both types of investors. It is possible *R_hosttrade* is not a good proxy for trade openness. Including a variable to account for trade agreements might have lead us to different results.

We now discuss evidence for hypotheses that pertain to types of FDI pursued, horizontal and both "upward" and "downward" vertical FDI. No correlation is found between *R_lnGDPpercap* and FDI flows from nontraditional source countries, and a positive correlation is found for flows from traditional source countries. This provides compelling evidence to support H5, regarding the notion that the size of the host country market is of relatively little importance to nontraditional investors and very important to traditional investors, and also that nontraditional investors locate where their purchasing power is relatively small. The coefficient for the traditional source country subset implies that they invest larger amounts of money in wealthier countries rather than lower-income countries, likely due to the fear that investing in a developing country is a riskier. The

coefficient might also indicate that traditional investors pursue more horizontal FDI than vertical FDI. Andrés et al. (2012) found that horizontal FDI plays a similarly important role for both types of investors.

One of the reasons countries pursue vertical FDI is for labor cost savings. A less educated population generally translates to lower labor costs, and a higher difference in GDP per capita between the source and host country should also indicate the presence of vertical FDI. However, cheap labor is inefficient if the working population is completely unskilled or unable to acquire new skills. Some threshold of education needs to be attained in order to have productive labor, which is why the least-developed countries, many of which are in Africa, often receive little FDI attention. *R_education*, which measures the percent of primary school age school children enrolled, is not found to be statistically significant in either subset. This does not provide evidence in support of H11, that human capital formation is positively related to FDI flows. We further investigate motives for vertical FDI using the variable *P_diffGDPpercap*.

The assumption is that nontraditional firms are more likely to pursue horizontal FDI than vertical, and vice versa for traditional investors. Neither coefficient for *P_diffGDPpercap* is statistically significant; however, they almost reach the benchmark for statistical significance in each data subset. Both coefficients are quite small. As expected, larger FDI flows from traditional sources are induced by larger income gaps, giving support for H6, that these investors greatly value vertical FDI for labor cost savings. For FDI flows from nontraditional source countries, the coefficient is negative although fairly small. This gives evidence to support that larger investments are made when nontraditional sources are investing “upward” and smaller investments when

investing downward. Since larger investments are made in wealthier economies, and wealth is correlated with stability and fewer risks, this is a counterexample to the earlier hypothesis that nontraditional countries are not deterred by poor macroeconomic conditions. Or, it could be evidence that nontraditional investors strongly value asset-augmenting FDI. Andrés et al. (2012) found contradictory evidence, and rejected the hypothesis that larger income gaps drive vertical FDI from traditional sources. However, they suspected the variable itself to be insufficient to distinguish vertical FDI from other types of FDI, and suggest the use of productivity adjusted wage differentials in future research.

We further test for evidence of upward vertical FDI purportedly pursued by nontraditional sources using the variable *R_research*[14]. The variable measures research and development in the host country as a percent of GDP. The variable is significant and negatively correlated with FDI outflows from traditional countries, indicating that traditional investors are not looking to invest in technologically advanced economies. It also provides further evidence in support of downward vertical FDI, perhaps valued more than horizontal FDI by traditional sources. Interestingly, the variable is not significant using the nontraditional country subset, contradicting the earlier evidence that nontraditional investors value asset-augmenting FDI in order to absorb superior technology. Because there is weak evidence that emerging countries pursue asset-augmenting FDI, we find H3 to be inconclusive. Amighini and Franco (2012) did find

[14] *R_research* is used in place of a variable measuring percent of exports on the host country which qualify as high-tech used in Amighini and Franco (2012), due to the limitations the alternate variable placed on the number of observations used in the regressions.

evidence of asset-augmenting FDI, supporting the idea that emerging MNEs are locating in growing markets with higher technological knowledge[15].

Another driver of vertical FDI is access to natural resources, which is reflected in the variable *R_resourcedepletion*, a measure of natural resource depletion as a percent of GNI in the receiving country. Andrés et al. (2012) postulates that higher percentages of this variable indicate a natural resource endowment within the host country, and finds it induces higher probabilities of bilateral FDI flows, for both traditional and nontraditional source countries. Amighini and Franco (2012) found natural resources to be of importance, but not when only examining the manufacturing sector. On the contrary, we find it to be significant and negatively correlated with FDI outflows from traditional sources. It is not significantly correlated to FDI from nontraditional sources. This leads us to reject H7, as natural resources are not only uncorrelated with FDI from nontraditional sources, but their presence appears to negatively impact FDI flows from traditional sources. A possible explanation is that due to globalization, the majority of FDI from traditional sources is geared towards the manufacturing industry; therefore, flows related to natural resource exploitation are overshadowed. It is also possible that the variable itself is a poor measure of natural resource endowment.

Next we examine the coefficients on the dyadic variables. Cultural similarities between country pairs are found to be of great importance and allow us to strongly accept H2. The coefficients on the country pair sharing a border, *P_contiguous*, sharing a major language, *P_commonlanguage*, and sharing previous colonial ties, *P_colony*, are all significant and positively correlated with FDI flows from traditional source countries.

[15] Keep in mind that the data used by Amighini and Franco (2012) concerns nontraditional MNEs locating in other emerging economies. He does not account for the location of these MNEs in advanced economies.

The coefficients on *P_contiguous* and *P_commonlanguage* are significant and positively correlated with FDI flows from nontraditional source countries. The magnitude of the coefficient on *P_contiguous* for the nontraditional source country data subset is more than twice as large as that of the traditional country subset, and the coefficient on *P_commonlanguage* is almost five times as large. The statistical anomaly is *P_colony*, which is positive and significant for FDI from traditional countries but uncorrelated with FDI from the nontraditional country data set. Our findings largely corroborate the conclusions made by Andrés et al. (2012).

The next set of country-pair similarities pertain to the gravity model theory in FDI literature. It is hypothesized that distance is negatively correlated with FDI outflows from both source types, with a stronger negative effect on outflows from nontraditional investors. The variable *P_distance* is significant and negatively correlated to FDI flows for both data sets, however does not appear to deter one source country type more than the other. There is little evidence to support H4. In contrast, Andrés et al. (2012) found evidence that nontraditional investors are much more sensitive to distance than traditional investors.

We hypothesize that all source types, especially nontraditional, are more comfortable investing larger amounts in locations that are more physically similar to their home, both for nostalgic and practical reasons. The results do not unanimously verify this conjecture made in H12. For the subset concerning FDI flows from traditional countries, all variables except for *P_forest* are statistically significant. *P_area* is positively correlated with FDI flows, meaning traditional sources are investing larger amounts in countries of different physical size, although the coefficient itself is quite small.

*P_elevation* is also positively correlated with FDI flows, again suggesting that FDI flows are higher when going to countries with different terrain. The only variable whose sign is expected is *P_rain*. Traditional investors seem to invest less in areas which have different amounts of rainfall than their home.

As for nontraditional investors, *P_forest* and *P_elevation* are significantly correlated with FDI flows. If the country pair does not have a similar percent of forested land area, this seems to reduce FDI flows. On the contrary, larger differences in elevation seem to encourage FDI flows. Because these variables are new to FDI determinant analysis, more research should be done to determine possible explanations for why they are significantly correlated to FDI flows.

Our goal was to add a new perspective to the analysis on FDI determinants by finding variables that serve as a proxy for national security. *R_armysize* is significantly and negatively correlated with FDI flows from traditional source countries, indicating that traditional investors might be mistrustful of the need for a large military presence. A related variable is *R_militaryspending*, which is military expenditure as a percent of GDP in the host nation. Although uncorrelated with FDI flows from traditional sources using the conventional benchmark of significance, it is positively and significantly correlated with FDI from nontraditional sources. Nontraditional direct investors may in fact be reassured and encouraged by the prioritization of country security. This finding, along with the insight from *R_infrastructure*, diminishes our ability to accept H13 and the overarching concept that nontraditional investors are less deterred by all types of risk than traditional investors.

The last variable that has not yet been discussed and was not a major focus of this study, but rather used as a control variable, is *R_agglomeration*. The main emphasis of the work done by Amighini & Franco (2012) was to isolate the effects industry and national agglomerations have on FDI flows. They claim that the positive influence of agglomeration economies is the most relevant factor that affects FDI flows from nontraditional source countries to other developing economies. Andrés et al. (2012) also found evidence that agglomeration effects are particularly strong for nontraditional investors. Although we do not incorporate variables accounting for FDI stocks within host economies, we do measure gross fixed capital formation as a percent of GDP. It is generally agreed upon that FDI flows follow where FDI has already proven to be successful. Indeed, our results partly confirm this same claim, as the variable is significantly and positively correlated with FDI from traditional countries. *R_agglomeration* was not significantly correlated with FDI flows from nontraditional countries, contradicting the conclusions made by Amighini and Franco (2012) and Andrés et al. (2012).

# CHAPTER IV

# CONCLUSIONS

Of our 13 hypotheses, there was mild to strong evidence in support of four (H2, H5, H6 and H8), ambiguous results concerning three (H1, H12 and H13), and little to no evidence to support or strong evidence to reject six (H3, H4, H7, H9, H10 and H11). Our varying results indicate a need for much further exploration into this field concerning how investment behavior differs among traditional and nontraditional investors.

The main message that stems from our research is that a blanket generalization for the behavior of nontraditional source countries cannot be made, concerning the hypothesis that they are less deterred by instability, including that of political and economic nature. Although the factor measuring the likelihood of the host country government being overthrown undemocratically or in a violent manner is not correlated with FDI outflows, high levels corruption and low levels of infrastructure both appear to negatively impact nontraditional investors' FDI decisions.

We conclude that determinants of FDI from traditional and nontraditional sources are largely different, and that the literature is still far from reaching a general consensus. It seems apparent that nontraditional investors take into account less information when making investment decisions, meaning there is the possibility that less-attractive destinations of outward investment may be able to more easily attract FDI flows if they strategically target potential investors. However, how each source type responds to risk

depends on that particular element of risk, whether it be related to the government, infrastructure, etc.

A possible shortfall of our analysis performed in this study is that the variable measuring openness to trade is not a useful proxy for the impact of trade agreements on FDI flows. There is an entire other body of literature debating the benefits of bilateral trade agreements, such as NAFTA. It might be helpful to conduct further analysis incorporating trade variables specific to the country pair to determine if they positively impact FDI flows.

Another beneficial addition to the data would be measurements of stock accumulations in the receiving country from various source countries, instead of using *R_agglomeration* as a proxy. Most importantly, the analysis could be greatly enhanced if datasets with higher reporting rates of FDI flows between country pairs were used.

We recommend that future research pursue further classification of the data, and continue to test for systematic differences in determinants across varying industry sectors, source country types, and receiving country types. For example, it would be interesting to test how the variables impact flows among FDI originating in traditional and nontraditional source countries, and locating in both developed and emerging source countries. This means a total of four regressions would be needed.

Overall, while a straightforward recommendation to receiving countries on how to further attract FDI may not be possible given the lack of definitive conclusions among previous studies and this paper, this should be kept in mind: “General policies aimed at altering the fundamentals are more important than specific policies aimed at attracting particular investments” (Chowdhury & Mayrotas, 2006, p. 18).

CHAPTER XI

APPENDICES

## Appendix A: Variable Definitions

TABLE A.1

DEFINITIONS OF VARIABLES AND DATA SOURCES

| VARIABLES | | Definition | Source |
|---|---|---|---|
| $y$ | *lnFDI* | Natural logarithm of FDI outflows from source country to receiving country in terms of US dollars | OECD & UNCTAD |
| $X$ | *R_inflation* | Inflation as measured by the annual growth rate of the GDP implicit deflator in the host country | World Bank |
| $M$ | *R_agglomeration* | Gross fixed capital formation in the private sector as percent of GDP in the host country | World Bank |
| | *P_diffGDPpercap* | The difference in GDP per capita of the source and receiving country in terms of US dollars | World Bank & author's method |
| | *R_lnGDPpercap* | Natural logarithm of GDP per capita in US dollars in the receiving country | World Bank & author's method |
| $P$ | *R_voice* | Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media, in the receiving country | World Bank Worldwide Governance Indicators |
| | *R_polistable* | Reflects perception of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism, in the receiving country | World Bank Worldwide Governance Indicators |

| | | | |
|---|---|---|---|
| | *R_corruption* | Reflects perception of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests, in the receiving country | World Bank Worldwide Governance Indicators |
| *I* | *R_sanitation* | Improved sanitation facilities (the percent of the population with access), in the receiving country | World Bank |
| | *R_infrastructure* | A logistics performance index indicating the quality of trade and transport-related infrastructure in the host economy | World Bank |
| *K* | *R_education* | Adjusted net enrollment rate in primary school as a percent of all primary school age children, in the receiving country | World Bank |
| *T* | *R_hosttrade* | Trade volume (exports plus imports) of goods and services as a percent of GDP, in the receiving country | World Bank |
| *V* | *R_research* | Research and development expenditure as a percent of GDP in the receiving country | World Bank |
| | *R_resourcedepletion* | Adjusted savings: natural resources depletion as a percent of GNI in the receiving country | World Bank |
| *B* | *R_startbusiness* | Average number of days needed to start a new business in the receiving country | World Bank Group, "Doing Business" |
| | *R_constructionprocedures* | Average number of procedures for dealing with construction permits in the receiving country | World Bank Group, "Doing Business" |
| | *R_legalrights* | Strength of legal rights index concerning the financial sector in the receiving country | World Bank Group, "Doing Business" |
| | *R_investorprotection* | An index measuring strength of investor protection in the receiving country | World Bank Group, "Doing Business" |
| *C* | *P_contiguous* | Dummy variable set equal to 1 when the source and receiving country share a border | CEPII Gravity Data Set |
| | *P_commonlanguage* | Dummy variable set equal to 1 when the source and receiving country share an official language | CEPII Gravity Data Set |

| | | | |
|---|---|---|---|
| | *P_colony* | Dummy variable set equal to 1 when source and receiving country have previous colonial ties | CEPII Gravity Data Set |
| $G$ | *P_distance* | Distance (in km) between the latitude and longitude of the most important cities/agglomerations (in terms of population) in the receiving and source country | CEPII Gravity Data Set |
| | *P_area* | Absolute value of difference in land area between the source and receiving country | World Bank |
| | *P_forest* | Absolute value of difference in the percent of total land area forested between the source and receiving country | World Bank |
| | *P_elevation* | Absolute value of difference between percent of total land area below 5 meters in the source and receiving country | World Bank |
| | *P_rain* | Absolute value of difference in annual rainfall (in mm) between the source and receiving country | World Bank |
| $N$ | *R_armysize* | Armed forces personnel as a percent of the total labor force in the receiving country | World Bank |
| | *R_militaryspending* | Military expenditure as a percent of GDP in the receiving country | World Bank |

## Appendix B: Descriptive Statistics

TABLE B.1

DESCRIPTIVE STATISTICS WHEN $S = T$, 2006-2011

| VARIABLES | | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| $y$ | *lnFDI* | 17.98 | 2.87 | 6.90 | 25.41 |
| $X$ | *R_inflation* | 6.59 | 8.40 | -33.12 | 80.75 |
| $M$ | *R_agglomeration* | 23.07 | 6.83 | 2.22 | 59.39 |
| | *P_diffGDPpercap* | 34952.61 | 27619.71 | -158651.4 | 114277 |
| | *R_lnGDPpercap* | 8.46 | 1.55 | 5.00 | 12.13 |
| $P$ | *R_voice* | -.02 | 1.00 | -2.27 | 1.63 |
| | *R_polistable* | -.02 | .99 | -3.32 | 1.94 |
| | *R_corruption* | -.01 | .99 | -1.92 | 2.55 |
| $I$ | *R_sanitation* | 71.25 | 29.29 | 9 | 101 |
| | *R_infrastructure* | 2.62 | .70 | 1.1 | 4.34 |
| $K$ | *R_education* | 90.30 | 11.63 | 34.88 | 100 |
| $T$ | *R_hosttrade* | 92.63 | 51.67 | 22.11 | 460.47 |
| $V$ | *R_research* | 1.11 | .99 | .01 | 4.80 |
| | *R_resourcedepletion* | 7.78 | 12.54 | 0 | 104.124 |
| $B$ | *R_startbusiness* | 39.09 | 60.25 | 1 | 694 |
| | *R_constructionprocedures* | 16.16 | 6.98 | 6 | 61 |
| | *R_legalrights* | 5.43 | 2.47 | 0 | 10 |
| | *R_investorprotection* | 5.03 | 1.56 | 1 | 9.7 |
| $C$ | *P_contiguous* | .01 | .11 | 0 | 1 |
| | *P_commonlanguage* | .15 | .35 | 0 | 1 |
| | *P_colony* | .04 | .19 | 0 | 1 |
| $G$ | *P_distance* | 7321.50 | 4460.48 | 19.12 | 19586.18 |
| | *P_area* | 4684275 | 1.33e+07 | 0 | 1.30e+08 |
| | *P_forest* | 24.57 | 18.67 | 0 | 94.41 |
| | *P_elevation* | 10.80 | 18.51 | 0 | 100 |
| | *P_rain* | 712.89 | 553.12 | 0 | 2765 |
| $N$ | *R_armysize* | 1.42 | 1.60 | 0 | 10.64 |
| | *R_militaryspending* | 2.14 | 1.48 | .04 | 10.95 |

TABLE B.2

DESCRIPTIVE STATISTICS WHEN $S = N$, 2006-2011

| | VARIABLES | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| $y$ | *lnFDI* | 15.46 | 2.88 | 6.90 | 23.23 |
| $X$ | *R_inflation* | 6.59 | 8.40 | -33.12 | 80.75 |
| $M$ | *R_agglomeration* | 23.07 | 6.83 | 2.22 | 59.39 |
| | *P_diffGDPpercap* | -1941.43 | 2508.36 | -185215.1 | 94983.32 |
| | *R_lnGDPpercap* | 8.46 | 1.55 | 5.00 | 12.13 |
| $P$ | *R_voice* | -.02 | 1.00 | -2.27 | 1.63 |
| | *R_polistable* | -.02 | .99 | -3.32 | 1.94 |
| | *R_corruption* | -.01 | .99 | -1.92 | 2.55 |
| $I$ | *R_sanitation* | 71.25 | 29.29 | 9 | 101 |
| | *R_infrastructure* | 2.62 | .7 | 1.1 | 4.34 |
| $K$ | *R_education* | 90.30 | 11.62 | 34.88 | 100 |
| $T$ | *R_hosttrade* | 92.63 | 51.67 | 22.11 | 460.47 |
| $V$ | *R_research* | 1.11 | .99 | .01 | 4.80 |
| | *R_resourcedepletion* | 7.78 | 12.54 | 0 | 104.12 |
| $B$ | *R_startbusiness* | 39.09 | 60.25 | 1 | 694 |
| | *R_constructionprocedures* | 16.16 | 6.98 | 6 | 61 |
| | *R_legalrights* | 5.43 | 2.47 | 0 | 10 |
| | *R_investorprotection* | 5.03 | 1.56 | 1 | 9.7 |
| $C$ | *P_contiguous* | .02 | .14 | 0 | 1 |
| | *P_commonlanguage* | .08 | .27 | 0 | 1 |
| | *P_colony* | .008 | .09 | 0 | 1 |
| $G$ | *P_distance* | 8505.368 | 4558.18 | 2.73 | 19182.04 |
| | *P_area* | 4454367 | 1.32e+07 | 0 | 1.30e+08 |
| | *P_forest* | 25.10 | 17.66 | 0 | 86.64 |
| | *P_elevation* | 10.51 | 20.73 | 0 | 100 |
| | *P_rain* | 825.14 | 618.30 | 0 | 2959 |
| $N$ | *R_armysize* | 1.42 | 1.60 | 0 | 10.64 |
| | *R_militaryspending* | 2.14 | 1.48 | .04 | 10.95 |

## Appendix C: Inter-variable Correlation

TABLE C.1

INTER-VARIABLE CORRELATION GREATER THAN 0.70,
WHEN $S = T$, 2006-2011

| | *P_lnGDPpercap* | *R_voice* | *R_corruption* | *R_sanitation* | *R_infrastructure* |
|---|---|---|---|---|---|
| *R_voice* | 0.7529 | - | - | - | - |
| *R_corruption* | 0.8609 | 0.8402 | - | - | - |
| *R_sanitation* | 0.8019 | - | - | - | - |
| *R_infrastructure* | 0.8495 | 0.7388 | 0.8949 | - | - |
| *R_education* | - | - | - | 0.7019 | - |
| *R_research* | - | - | 0.7426 | - | 0.7558 |

TABLE C.2

INTER-VARIABLE CORRELATIONS GREATER THAN 0.70,
WHEN $S = N$, 2006-2011

| | *P_diffGDPpercap* | *R_lnGDPpercap* | *R_voice* | *R_corruption* | *R_sanitation* |
|---|---|---|---|---|---|
| *R_lnGDPpercap* | -0.8112 | - | - | - | - |
| *R_voice* | - | 0.7529 | - | - | - |
| *R_corruption* | -.8225 | 0.8609 | 0.8402 | - | - |
| *R_sanitation* | - | 0.8019 | - | - | - |
| *R_infrastructure* | -0.7790 | 0.8495 | 0.7388 | 0.8949 | - |
| *R_research* | - | - | - | 0.7426 | - |
| *R_education* | - | - | - | - | 0.7019 |

## Appendix D: Hausman Test

TABLE D.1

HAUSMAN TEST RESULTS

| $H_0$ : difference in coefficients not systematic | |
|---|---|
| $s = T$ | $s = N$ |
| $Chi^2(18) = 35.95$<br>$Prob > Chi^2 = 0.0072$ | $Chi^2(18) = 15.89$<br>$Prob > Chi^2 = 0.6003$ |

## Appendix E: Sensitivity Analysis

TABLE E.1

SENSITIVITY ANALYSIS, 2006-2011

| | VARIABLES | GLS on levels $s = T$ | GLS on levels $s = N$ | Panel tobit $s = T$ | Panel tobit $s = N$ |
|---|---|---|---|---|---|
| $X$ | *R_inflation* | 5228827 | 577381.3 | .0756 | .0973 |
| $M$ | *R_agglomeration* | 1.89e+07 | -654478.2 | .1958*** | -.0363 |
| | *P_diffGDPpercap* | 12781.17* | 500.3428 | -.00001 | -.00003 |
| | *R_lnGDPpercap* | 5.22e+08 | 3.49e+07** | .4041 | -1.5920 |
| $P$ | *R_voice* | -1.16e+08 | -1.07e07 | -.1984 | -.8576 |
| | *R_polistable* | -8.09e+07 | -1146142 | -.4675 | .5834 |
| | *R_corruption* | -4.08e+07 | -1.18e+07 | -.3001 | 1.2839 |
| $I$ | *R_sanitation* | -1.62e+07 | .1403930** | -.0055 | .0108 |
| | *R_infrastructure* | 2.28e+09*** | 9151555 | 2.7310*** | .8087 |
| $K$ | *R_education* | 2.17e+07* | 1389863** | .0234 | .0966 |
| $T$ | *R_hosttrade* | 1.31e+07*** | 332561.2* | -.00005 | -.0064 |
| $V$ | *R_research* | -8.31e+08* | -3638735 | -.6985 | -.8710 |
| | *R_resourcedepletion* | -3.84e+07 | -3032396** | -.1154** | -.0529 |
| $B$ | *R_startbusiness* | -3061906 | -164017.9 | .0148 | .0214 |
| | *R_constructionprocedures* | 6550591 | 851724.9 | .1340*** | .0279 |
| | *R_legalrights* | -7.80e+07 | -2734108 | -.0242 | .0687 |
| | *R_investorprotection* | -1.53e+08 | 3750488 | .3904* | .0041 |
| $C$ | *P_contiguous* | 2.35e+09 | 1.24e+08*** | .1005 | 2.0243* |
| | *P_commonlanguage* | 1.22e+09 | 2.58e+08* | 2.9114*** | 4.1664* |
| | *P_colony* | 2.63e+09 | 8.89e+07 | 1.6458 | 2.7305 |
| $G$ | *P_distance* | -56713.53* | -4001.43** | -.00003 | -.0001 |
| | *P_area* | 365.5967** | 14.6297 | 1.36e-07 | 1.31e-07 |
| | *P_forest* | -223206.1 | -654371.6 | -.0104 | -.0571** |
| | *P_elevation* | 3.35e+07 | 6147878* | -.0010 | .0723* |
| | *P_rain* | -206105.3 | 24213.81 | -.0012** | -.0008 |
| $N$ | *R_armysize* | -7.51e+08*** | -1.67e+07* | -.7413 | -.7561 |
| | *R_militaryspending* | 1.01e+09*** | 2.04e+07** | .7473* | .3441 |
| Note ***, **, and * denote significance at the one, five, and ten percent level, respectively. | | $R^2$ = 0.1676<br>Prob > $Chi^2$ = 0.0000<br># of obs = 1845 | $R^2$ = 0.1880<br>Prob > $Chi^2$ = 0.0000<br># of obs = 1032 | Wald $Chi^2$ = 89.81<br>Prob > $Chi^2$ = 0.0012<br># of obs = 1443 | Wald $Chi^2$ = 45.14<br>Prob > $Chi^2$ = 0.0157<br># of obs = 622 |

## Appendix F: Traditional source country sample (22 of 54 total countries)

Australia, Austria, Belgium, Belgo-Luxembourg, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United States

## Appendix G: Nontraditional source country sample (32 of 54 total countries)

Argentina, Bermuda, Brazil, Chile, China, Colombia, Costa Rica, Czech Republic, Ecuador, El Salvador, Estonia, Greece, Guatemala, Honduras, Hungary, India, Korea, Rep., Lebanon, Mexico, Mongolia, Paraguay, Poland, Portugal, Peru, Slovak Republic, Slovenia, Thailand, Turkey, Uruguay, Venezuela, Vietnam

## Appendix H: Receiving country sample (213 total countries)

Afghanistan, Albania, Algeria, American Samoa, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Dem. Rep., Congo, Rep., Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Fiji, Finland, France, French Polynesia, Gabon, Georgia, Germany, Ghana, Greece, Grenada, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong SAR, China, Hungary, Iceland, India, Indonesia, Iran, Islamic Rep., Iraq, Ireland, Isle of Man, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Korea, Dem. Rep., Kuwait, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Macao SAR, China, Macedonia, FYR, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Fed. Sts., Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, Northern Mariana Islands, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Turks and Caicos Islands, Tuvalu, Uganda, Ukraine, United Arab Emirates, United States, Uruguay, Uzbekistan, Vanuatu, Vietnam, Virgin Islands (U.S.), Zambia, Zimbabwe

# CHAPTER VII

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